Integrated Chemical and Radiological Hazard Evaluation Worksheet

Site/Facility Basic Information			
Facility/Site Name:	618-10 Burial Ground / North Burial Ground		
Facility/Site Number:	618-10 Burial Ground /600	Document Number:	IHE-2009-0006
Facility/Site Location:	300-FF-2/600 Area	Document Revision:	3

SUMMARY OF SIGNIFICANT CHANGES
TO REVISION 3

1) Page 3 – Added reference to new Attachment 3, "618-10 Trench Burials, (A Partial List of Potential Anomalies)", and added reference to copies of the Rad Survey Records (RSRs) included in Attachment 3.
2) Attachment 1 to IHE, page 5 – Added sentence regarding NaK disposal practices in 1953 as noted by change bar.
3) Attachment 1, page 15, added reference "GE-1953a" as noted by change bar.
4) Attachment 3 to IHE – Added this entire section (spread sheets and copies of referenced RSRs) to IHE.

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Hazard Evaluation Phase	Date Completed	Verified By PE/RE
Site/Facility Evaluation	7/13/10	Shaook Khabir
Project Planning or Design	N/A	N/A
Mobilization/Job Execution	N/A	N/A

Site/Facility Contaminant Information

Facility Processes (Provide brief description of site/facility uses or activities and list the resources/references used to develop this information)

Individual waste shipment records for all wastes shipped to the 618-10 Burial Ground were not generated during the lifetime of the burial ground since there was no statutory or procedural requirement to do so. The historical information contained in this document has been obtained primarily from published documents, letters, memos, log book data, photographs and radiological survey records.

The 618-10 Burial Ground, also known as 300 North Burial Ground and the 300 Area Technical Burial Ground, is located approximately 4 miles northwest of the 300 Area, west of Route 4. It operated from March 1954 to March 1962 and from October 1962 to September 1963. From March 1962 to October 1962 the Vertical Pipe Units (VPUs) were still accepting waste while the trenches remained closed. The entire burial ground reopened in 1962 to support waste disposal activities while the VPUs and caissons were installed in the 618-11 Burial Ground, and closed for the final time after the 618-11 Burial Ground was fully operational. The 618-10 Burial Ground was covered with 2 feet of soil after closure in 1963 and was stabilized with an additional 2 feet of clean backfill in 1983.

The 618-10 Burial Ground as built design consists of 12 trenches and 94 VPUs as shown in drawings H-3-9982 and H-6-934. Trench design dimensions range from 15 to 97 meters long x 12 to 21 meters wide x 7.6 meters deep. However, the design dimensions and location of some of the trenches on the drawing differ considerably from geophysical studies performed in 2006. Three significant differences are:

1) Trench 3 on the drawing appears as undisturbed soil in the geophysical evaluation,
2) The undisturbed soil between trenches 1 and 5 on the drawing appears to have waste disposed there and,
3) The undisturbed area between trenches 9 and 10, and smaller areas throughout the site as shown on the drawing also appear to have waste disposed in those locations.

The historical review suggests 3 VPU designs were used at the 618-10 Burial Ground. Note that what is referred to as VPUs today, was referred to as pipes, burial pipes, culvert pipes, concrete pipes, waste stand pipes and dry wells in the 1950s/1960s.

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1) Several lengths of "pipe" 14" diameter x 15' long buried upright with bottoms sealed in concrete were installed in June 1954. (HW-32317-DEL)
2) Ten VPUs were installed in January 1955 as "pipes", 1' diameter x 10' long buried upright. (HW-34631-DEL)
3) A third design consists of five open bottom, 55 gallon drums, 22 inches in diameter, welded together and buried upright. (WHC-MR-0415) Most VPUs are believed to be of this design.

The site received a variety of waste from the 300 Area operations. As mentioned above, individual waste shipment records for all wastes shipped to the 618-10 Burial Ground were not generated, since there was no statutory requirement to do so at that time. Therefore, segregation of TRU wastes from non-TRU wastes was not conducted over the lifetime of the burial ground. Segregation of TRU wastes was mandated by the AEC in 1970.

The site contains a broad spectrum of low activity radioactivity, transuranic (TRU), and hazardous wastes including fission products, byproduct material (thorium and uranium), plutonium and laboratory chemicals. Low activity wastes were disposed to the trenches using a variety of containers including cardboard boxes, steel drums, metal buckets, wooden boxes, self-contained equipment items, and plastic wraps. Large items of low activity waste were usually boxed in plywood or placed in plastic and disposed of in the trenches. Weight and size of the disposed item dictated the type of container used. Radiation levels of low activity waste generally varied from 5 to 200 mR/hr. @ 1' from a sealed container, although much higher readings were occasionally experienced. Some high activity waste and plutonium contaminated liquid waste was sealed in concreted 55 gallon drums. Some concreted drums also contained an additional 1 or 2 inches of lead shielding. These drums had an 8 inch diameter galvanized metal culvert centered in the 55 gallon drum, surrounded by concrete on the bottom and sides. The culvert may also have lead wrapped around it, depending on shielding requirements. High activity liquid or solid waste was placed in the culvert. The culvert was capped with a lead plate and concrete poured in to fill the void space. These concreted and lead shielded barrels were also disposed of in the trenches since they were too large to fit into the VPUs. Also, some high activity solid waste in the form of Chemical Warfare Service (CWS) and High Efficiency Particulate Air (HEPA) filters from laboratory ventilation systems were packaged in cartons, since they were too large to be contained in 55 gallon drums, and disposed of to the trenches. Other intermediate activity and high activity wastes were generated in hot cell activities, captured in "gunk catchers, milk pails, juice cans and paint cans" and then remotely deposited into the VPUs from shipping casks used to transport these (intermediate and high activity) wastes. Note that the term "high level waste" as used in the 1950s/1960s was based on activity readings at the time and is not the same as the current regulatory definition of high level waste.

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The 618-10 Burial Ground waste inventory is a result primarily from waste generating activities at the 327 Radiometallurgy Laboratory, the 325 Radiochemistry Laboratory, the 329 Biophysics Laboratory, and the 3706 Laboratory. The percentage of total waste sent to 618-10 from these facilities is estimated at 61, 20, 5, and 4 respectively. Other facilities that contributed to the waste inventory were 326 Building (2%), 309 Building (2%), 321 Building (1%), 3730 Building, (1%), 1171 Building (1%), 308 Building (1%) and 306 Building (0.4%). In addition, a combined total of less than 2% of the total waste inventory is attributed to 1166, 3745-B, 3741, 3718, 3707-C, 340, 328, 314, 305-B, 303, 3707C, 3718 Buildings, the University of Washington, the U.S. Bureau of Mines in Albany, OR . and University of Montana (WCH Doc #0605578)

Together the 327 Radiometallurgy and 325 Radiochemistry Laboratories contributed approximately 81% of the waste disposed to 618-10. For this reason, and since these laboratories' activities are fairly well documented, operational and waste management-related activities associated with these two laboratories serve as the primary basis to describe the wastes disposed to 618-10.

Attachment 1, "Description of 300 Area Waste Generating Facilities and the Waste Streams each Facility Contributed to the 618-10 Burial Ground Inventory", Attachment 2, "Activities Timeline for the 618-10 Burial Ground" and Attachment 3, "618-10 Trench Burials (A Partial List of Potential Anomalies)" and copies of the referenced RSRs are part of this IHE.

The Record of Decision for the 300-FF-2 Operable Unit, approved 4/5/01, establishes the cleanup levels applicable to the remediation of 618-10. A subsequent Explanation of Significant Difference, issued in 2004, altered the cleanup levels for the 618-10 Burial Ground.

The following resources/references were used to develop the information for this evaluation:

Drawing H-3-9982, Rev. 5, 618-10 North Burial Ground As-Built, May 9, 1974.

Drawing H-6-934, Rev. 1, 618-10 North Burial Ground, October 12, 1984.

HW-29460, *327 Building Procedure,* September 28, 1953.

HW-31267-DEL, *Monthly Report Hanford Atomic Products Operation for March 1954*, April 23, 1954.

HW-32317-DEL, *Monthly Report Hanford Atomic Products Operation for June 1954,* July 26, 1954.

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HW-34631-DEL, *Monthly Report Hanford Atomic Products Operation for January 1954*, February 21, 1955.

HW-29460, *Radiometallurgy 327 Building Procedure, Rev 1,* May 15, 1956.

PNL-2557, *Characterization of the Hanford 300 Area Burial Grounds*, January 1980.

GI-0602202, *618-10 Burial Ground Geophysical Summary Focusing on Metal Concentrations,* July 21, 2009.

WHC-MR-0388, *Past Practices Technical Characterization Study - 300 Area - Hanford Site*, December 1992.

WCH-MR-0415, *Miscellaneous Information Regarding Operation and Inventory of 618-10 Burial Ground.*

WCH Doc # 0605578, *Records Search and Review of Records to Support Expected Radionuclide Inventory and Concentration in the 618-10 Burial Ground,* April 20, 2010, Prepared by Dade Moeller Associates for Washington Closure Hanford.

HNF-EP-0649, *Characterization of the 618-11 Solid Waste Burial Ground, Disposed Waste, and Description of the Waste Generating Facilities*, October 1997.

DOE/EIS-0113, *Final Environmental Impact Statement, Disposal of Hanford Defense High Level, Transuranic and Tank Wastes*, Volume 2, December 1987.

WHC-EP-0696, *Characterization of Past and Present Waste Streams from the 325 Radiochemistry Building,* December 1993.

Declaration of the Interim Action Record of Decision for the 300-FF-2, Operable Unit, April 5, 2001.

Explanation of Significant Difference for the 300-FF-2 Operable Unit Record of Decision, May 6, 2004.

D&D-23840, *Radiological Survey Records for the 618-10 and 618-11 Burial Grounds (1953 through 1967)*, Rev. 0, February 8, 2005.

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Expected Contaminants of Potential Concern by Contaminant Class	
Radionuclides	Am-241, Au-198*, Ba-137m*, C-14, Ca-45*, Cd-113m*, Cm-242*, Cm-243, Cm-244*, Cs-134*, Cs-135, Cs-137, Co-60*, Eu-152*, Eu-154*, Eu-155*, H-3*, I-129, I-131*, I-132*, Kr-85*, Mn-54*, Na-24*, Nb-93m*, Np-237, P-32*, Pa-231, Pa-234*, Pa-234m*, Pd-107, Pm-147*, Pu-238, Pu-239, Pu-240, Pu-241*, Pu-242, Ra-226, Ru-104, Ru-103*, Ru-106*, Sb-125*, Sb-126*, Sb-126m*, Sm-151, Sn-121m, Sn-126, Sr-90, Te-125m*, Tc-99, Th-231*, Th-232, Th-234*, U-233, U-234, U-235, U-238, Y-90*, Zn-65*, Zr-93, Zr-95. * indicates ½ life <25 years
Gamma Spectroscopy	Am-241, Ba-137m, Ce-144, Cs-134, Cs-135, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239, Pu-240, Pu-242, Ra-226, Te-125m, Tc-99, U-233, U-234, U-235, U-238
Gross alpha	Am-241, Cm-241, Cm-244, Np-237, Pa-231, Pa-234, Pa-234m, Pu-238, Pu-239, Pu-240, Pu-242, Ra-226, Th-231, Th-232, Th-234, U-233, U-234, U-235, U-238
Gross beta	Au-198, C-14, Ca-45, Co-60, Ce-144, Cs-134, Cs-135, Cs-137, Eu-152, Eu-154, Eu-155, H-3, I-129, I-131, I-132, Kr-85, Mn-54, Na-24, Nb-93m, P-32, Pd-107, Pm-147, Pu-241, Ru-103, Ru-106, Sb-125, Sb-126, Sm-151, Sn-121m, Sn-126, Sr-90, Te-125m, Tc-99, Y-90, Zn-65, Zr-93, Zr-95.
Metals	Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Cadmium, Calcium, Chromium, Copper, Gadolinium, Gold, Iron, Iodine (as solid, liquid and/or gas), Lanthanum, Lead, Lithium, Magnesium, Manganese, Mercury, Nickel, Plutonium, Potassium, Praseodymium, Silver, Sodium, Thorium, Tin, Uranium, Zinc, Zirconium. (The SOP for 327 Lab required deactivation of metallic sodium and potassium prior to disposal, see Attachment 1 for discussion of beryllium and NaK. Some Aluminum, Thorium, Uranium and Zirconium are expected to be in the form of turnings and fines).
Anions	Aluminate, Cyanide, Chloride, Dichromate, Diuranate, Fluoride, Fluosilicate, Hydroxide, Iodide, Molybdate, Nitrate, Perchlorate, Permanganate, Phosphomolybdate, Phosphonate, Sulfamate, Thiosulphate.
Mercury	Mercury is expected to be present (primarily from laboratory equipment).
pH	Acidic and caustic residues are likely to be encountered. pH values expected to vary due to disposal of strong acids and strong bases.
Sulfides	Sulfides are likely.
Cyanides	Nickel Ferrocyanide, Copper Ferrocyanide, Cobalticyanide, Zinc Ferrocyanide.

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(Radiation Survey #810114 dated 11/26/1957 cites disposal of cyanides to trenches).			
Volatile Organics (VOCs)	Acetone, Xylene, Toluene, Hexone, Ethanol, Methanol, Hexone, Carbon Tetrachloride, Methyl Ethyl Keytone, Benzene, Methyl Isobutyl Ketone, cleaning solvents, paint thinners may present in waste stream if volatization is incomplete.		
Semi-Volatile Organics (SVOCs)	Tributyl phosphate, Picric Acid, Dinitrophenol, Acenaphthane, Machine shop lubricants, and other SVOAs could be present if volatization is incomplete.		
Total Petroleum Hydrocarbons (TPH)	Waste oils disposed in drums and trenches.		
Polycyclic Aromatic Hydrocarbons (PAH)	None identified, however there is a likelihood some PAHs may be contained in waste oils and equipment disposed of at the site.		
Pesticides	None identified.		
Chloro-Herbicides	None identified.		
PCBs	None identified, however there is a likelihood some PCBs may be contained in waste oils and equipment (ex. transformers, capacitors) disposed of at the site.		
Asbestos	Asbestos was used in gloveboxes, CWS filter media, gaskets and as insulating materials. There is also a potential for asbestos from building construction/demolition debris.		
Other:	1) **Condemned narcotics** (Reference Radiation Survey 290177, no date). 2) **Acids:** Acetic Acid, Antimonic Acid, Boric Acid, Citric Acid, Hydrocyanic Acid, Hydrochloric Acid, Hydrofluoric Acid, Methyl Lactic Acid, Oxalic Acid, Perchloric Acid, Nitric Acid, Nitrous Acid, Nitriltriacetic Acid, Osmic Acid, Oxalic Acid, Perchloric Acid, Phosphoric Acid, Picric Acid, Sulfuric Acid, Tartaric Acid. 3) **Alkalies:** Ammonium Hydroxide, Hydrazine, Potassium Hydroxide, Sodium Hydroxide, Turco. 4) **Gases:** Ammonia, Arsine, Hydrogen Sulfide, Nitrogen Oxides, Sodium Fluoride, Iodine. 5) **Metal Alloys:** Aluminum-Silicon, Beryllium-Zircaloy-2, Beryllium-Zirconium, Bismuth-Beryllium, Brass, Bronze, Lithium-Aluminum, Lead-Cadmium, Neptunium-Aluminum, Polonium-Beryllium, Radium-Beryllium, Uranium-Aluminum, Uranium Chromium, Uranium-Lead, Uranium-Magnesium, Uranium-Plutonium, Uranium-Silicon, Uranium-Titanium, Sodium-Potassium. (See Attachment 1 for additional discussion regarding disposal of NaK and Beryllium alloys.)		

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6) **Oxides:** Aluminum Oxide, Americium Oxide , Cupric Oxide, Curium Oxide, Hydrogen Peroxide, Magnesium Oxide, Neptunium Oxide, Niobium Pentoxide, Peroxide, Plutonium Oxide, Sodium Hydroxide, Thorium oxide, Uranium oxide, Vanadium Pentoxide.

7) **Oxidizers:** Peroxides, Permanganates, Magnesium Perchlorate.

8) **Sulfates:** Ceric Sulfate, Calcium Sulfate, Ferrous Sulfate, Ferrous Ammonium Sulfate, Sodium Sulfate, Sodium Thiosulfate, Uranium Sulfate.

9) **Nitrates:** Aluminum Nitrate, Ammonium Nitrate, Arsenic Nitrate, Barium Nitrate, Bismuth Nitrate, Cesium Nitrate, Chromium Nitrate, Copper Nitrate, Ferric Nitrate, Hydroxylamine Nitrate, Lanthanum Nitrate, Mercury Nitrate, Plutonium Nitrate, Silver Nitrate, Sodium Nitrate, Strontium Nitrate, Uranyl Nitrate, Yttruim Nitrate, Zinc Nitrate, Zirconium Nitrate.

10) **Carbonates:** Calcium carbonate, Sodium Carbonate

11) **Fluorides:** Ammonium Fluoride, Lanthanum Fluoride, Sodium Fluoride, Strontium Fluoride.

11) **Chlorides:** Ammonium Chloride, Barium Chloride, Calcium Chloride, Cesium Chloride, Ferric Chloride, Hydroxylamine Hydrochloride, Nickel Chloride, Potassium Chloride, Sodium Chloride.

12) **Iodides**: Potassium Iodide, Sodium Iodide, silver iodide.

13) **Molybdates:** Ammonium Molybdate.

14) **Phosphates:** Bismuth Phosphate, Sodium Phosphate, Tributyl Phosphate Orthophosphates, Pyrophosophates, Metaphosphates.

15)**Chromates:** Sodium dichromate.

16) **Organics:** Acenapthene, Ammonium Oxalate, Bromocresol Purple, Dinitrophenol, Dibutyl Butyl Phosphonate, Ethanol, Ethylene Glycol, Graphite, Hydroxylamine Hydrochloride, Paraffin Hydrocarbons (Kerosene), Picric Acid, Trichloroethane, Trisodium Hydroxyethyl Ethylene-Diamine Triacetate (HEDTA), Pentasodium Diethylene Triamine Pentaacetate (PDTA), Phenol Formaldehyde (from fiberglass air filters), Tetrasodium Ethylene Diamine-Tetraacetate (EDTA), Thenoyltrifluoroacetone-Benzene solutions, Freon refrigerant and Organic Resins (Dowex, Amberlite, Duolite).

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17) **Carcinogens:** Asbestos, Benzene, Beryllium, Carbon Tetrachloride, Cupferron, Formalin, Trichloroethylene.

18) **Anticipated Carcinogens:** Nickel Compounds, Phenolphthalein, Plutonium and Uranium Compounds.

Expected Waste Forms (Provide brief description)

Examples:

- Asbestos
- Batteries
- Boiler and stack residue
- Bulk Liquids (from sumps, tanks, etc.)
- Bulk solids (sludge, etc.)
- Demolition debris (concrete, rebar, pipes, etc.)
- Fluorescent lights (ballasts, tubes, etc.)
- Grease, oil, diesel fuel
- HEPA filters
- Lead (packing, shielding, etc.)
- Mercury (switches, vapor lights, etc.)
- Metal cuttings, shavings, pieces
- Radiation sources (exit signs, smoke detectors, etc.)
- Refrigeration systems (drinking fountains, chillers, etc.)
- Salvage materials (pumps, motors, etc.)
- Soil and sediment
- Tank foundations (oiled sand, asphalt)
- Tanks with special coating (asphalt, etc.)
- Unexpected waste forms (liquid or solids)

Waste forms intrinsic to site/facility (e.g., soil, concrete, tank sludge)

Waste forms intrinsic to the site include soil, rocks, vegetation and surface debris.

Waste forms brought to site/facility (e.g., drums, metal shavings, debris)

Waste forms generated at the site during remediation will consist primarily of contaminated equipment/supplies and personnel protective equipment. Waste forms disposed to the site over the lifetime of the site include but are not limited to:

1) Containers with remnants of irradiated fuel samples and irradiated reactor components on which (300 Area) laboratory analyses were performed.
2) Containers with high, intermediate and low activity mixed wastes including RCRA metals, Be, PCBs and asbestos.

NOTE: Typically, disposed wastes described in 1 & 2 above were placed in containers such as "gunk catchers, milk pails, juice cans and paint cans" and were deposited into the VPUs followed by covering with cement or soil to reduce shine. However, some of these wastes are present in the trenches in containers (such as cans, wood or cardboard) that may have decomposed over time, allowing the radiological and chemical constituents to mix with the native soil.

3) Concreted and lead lined 55 gallon drums containing fission products and TRU wastes, both liquid and solid.
4) High activity Chemical Warfare Service (CWS) and High Efficiency Particulate Air (HEPA) filters packaged in plastic, cardboard, wood and shielded drums.
5) Contaminated equipment and supplies such as gloveboxes, cut-off saws, lathes, centrifuges,

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pumps, and possibly an entire decontamination cell from 327 Radiometallurgy Laboratory

6) Drums/cans containing Al, Zr, U, and Th metal turnings, expected in water or oil matrix.
7) Containers with Be bearing alloys such as Al-Be, Zr-Be and Po-Be.
8) Drums/cans of irradiated graphite waste, depleted U and Th.
9) Containers with contaminated/spent laboratory instruments and supplies such as, chemicals, glassware, plastic, valves, pipes, etc.
10) Containers of materials used to decontaminate equipment or clean up rad/chemical spills (paper, mops, plastics, absorbents, PPE, etc.)
11) Containers with the remains of biological waste from the 329 Biophysics Laboratory.
12) Containers of oils and organic lubricants/chemicals.
13) Construction debris, including soil, potentially contaminated with radionuclides and chemicals, RCRA metals, Be, PCBs and asbestos.

Site Facility Contaminant Exposure Risk Evaluation

Exposure Concerns (Consider site/facility uses, COPCs present, work proposed, waste forms identified)

Internal and external exposures are concerns due to the presence of radiological and chemical materials, asbestos, Be, Hg, heavy metals and possibly residual VOCs/SVOCs. Remote handling of some wastes may be required if radiation levels exceed established limits.

Exposure Mitigations (PPE, monitoring, or other actions to protect staff)

ISMS precepts are to be followed. Training, work planning, contingency planning, PPE as determined by Radiological and Industrial Hygiene procedures, routine monitoring and real time monitoring, as well as ALARA practices, will be used to mitigate potential exposure.

Exposure Uncertainties (How certain are you about the potential exposures identified? Should other exposures be considered?)

Records for wastes shipped to the 618-10 Burial Ground were not generated during the lifetime of the burial ground since there was no statutory or procedural requirement to do so. The information contained in this document has been obtained primarily from a historical review of published documents, letters, memos, log book data, photographs, personnel interviews and radiological survey records. The potential for encountering high activity radiological materials, fission products and TRU material in both the trenches and in the VPUs is very high. The potential for exposure due to unknown sources exists, but is considered low.

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SE/D Team Concurrence with Worksheet Content			
	Name	Signature	Date
Environmental Lead	Darrin E. Faulk		6/15/10
Waste Management/Transportation Lead	Robert J. Vallem		6-24-10
Health & Safety/Industrial Hygiene Lead	Rajaqopal Ganapathy		6/23/10
Radiological Controls Lead	Paul J. Valentinelli		6/24/10
Field Support Lead	~~Ron Morris~~ SeDoller		6/15/10
Nuclear Safety Lead	Lynn R. Curry	for LR Curry	7/1/10

Worksheet Content Approval			
	Name	Signature	Date
Project Engineer (SE/D Team Lead)	Sharok Khabir		7/13/10
Resident Engineer (last; M/JE Team Lead)	Sharok Khabir		7/13/10

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ATTACHMENT 1

DESCRIPTION OF 300 AREA WASTE GENERATING FACILITIES AND THE WASTE STREAMS EACH FACILITY CONTRIBUTED TO THE 618-10 BURIAL GROUND INVENTORY

1.0 The 327 Radiometallurgy Laboratory

The 327 Radiometallurgy Laboratory opened in July 1953 and was operated by General Electric through the lifetime of the 618-10 Burial Ground. Originally, four hot cells were used to accomplish the laboratory's original mission of providing surveillance and rupture/failure analysis for fuel elements irradiated in Hanford Production Reactors from 1953 to 1970 (WHC-1992). A longer range mission included examining the effects of higher power levels of irradiation on reactor structural materials. The laboratory replaced the World War II 111-B "Test Building" and assumed many of the activities previously performed in 3706 Laboratory (see below). In 1960 the laboratory was expanded to nine hot cells (seven cast iron, two lead brick) to provide additional examination capabilities. Expansion to 11 hot cells occurred in early 1963 (WMFS- 1997). Later missions of the 327 Radiometallurgy Laboratory during the lifetime of the 618-10 Burial Ground included establishment of specifications for N Reactor fuel elements and process tubes, providing destructive examination (DE) and nondestructive examination (NDE) of N Reactor fuel and process tubes, examination of fuel capsules in support of the Hanford Works chemical isotopes campaign, DE and NDE of PRTR fuel elements and support for Hanford's waste vitrification projects of the 1960s. Based upon a review of radiological surveys of waste shipments, it is estimated the 327 Radiometallurgy Laboratory contributed approximately 61% of the total waste disposed to the 618-10 Burial Ground.

The nature of the work performed generated extremely high activity wastes. Irradiated materials, including failed fuel elements containing plutonium and fission products were examined with little decay time accumulated (WHC-1992). High activity wastes included irradiated material upon which examination has been completed, and which was not be returned to the plutonium recovery production process. Other high activity waste streams included filters from the cut-off saw submersion tank drain line, polishing discs, and dissolver solutions, all of which were normally disposed of in the VPUs. The table below shows results of a survey of the contents of four different one-gallon cans of 327 waste resulting from typical fuel sampling and testing operations (WMFS-1997).

Can No.	Quantity	Contents and Description
1	25	180 grit grinding discs
	10	240 grit grinding discs
	10	400 grit grinding discs
	5	600 grit grinding discs
	5	Pellon polishing discs
	5	Micro-cloth polishing discs
	60	Aluminum brads
	5	Cotton sample swabs
	5	Nylon sample grinding caps
	2	#8-1/2 rubber stoppers
	5	#1-1/4 plastic pipe caps
	2	13 Dram plastic vials and caps
	2	Kotex napkins

2	1	Mod. "G" manipulator boot
	1	4" ice cream carton
	4	#1-3/8 rubber tube caps
	12	1/2" rubber tube caps
	5	#1/2 x 3 snap cap vials
	5	Nylon sample grinding caps
	2	Kotex napkins
	2	WypAll paper towels
3	9	#1-1/4 plastic pipe caps
	7	1-1/3 x 2-1/8 plastic vials and caps
	5	1/2 x 1 tapered corks
	10	Nylon sample grinding caps
	1	#5-1/2 rubber stopper
	4	7/8 x 2 plastic vials and caps
	14	#1/4 rubber tube caps
	14	#1/4 threaded steel pipe ;lugs
	1	2 x 4 glass dish
	1	Ink Marker
	1	1' nylon paint brush
	1	#105 rigid tubing cutter
	1	#10-099 Stanley utility knife
	2	Kotex napkins
	2	WypAll paper towels
	1	12 x 14 plastic bag
4	2	Kotex napkins
	1	2 ¾ x 3 aluminum weight (round)
	1	1 ½ 1-1/8 x 3 aluminum block
	1	7/8 x 1 x 2 ½ SS block
	1	¼ x 1 x 1 x 7 aluminum angle metal
	1	Krylon spray paint can (punctured)
	1	24 x 24 cloth rag
	1	2 x 4 plastic bottle
	1	½ x 2 x 3 aluminum block
	2	rubber canner's gloves
	2	WypAll paper towels

In addition, the following list of chemicals was developed from review of 327 Building Procedure (GE-1956). These chemicals were used in support of the operations performed at the laboratory. Proper disposal of these chemicals generally was to the Retention Process Sewer (RPS) or Radioactive Liquid Waste Sewer, however, process upsets and/or high radiation levels often led to disposal of these chemicals to the 618-10 Burial Ground in the form of low, medium or high activity wastes. However, usually these laboratory chemicals were used in small quantities, and since any residues have had 30+ years to break down, it is unlikely they remain detectable in unsafe concentrations.

- The procedure (GE-1956) requires strong acids and alkalis to be drained into a sink connected to the crib waste or retention basin (depending on radioactivity) in small quantities while flushing with a continuous stream of water. These materials were prohibited from being placed in refuse containers, however the historical review revealed that materials such as dissolver solutions (concentrated acid solutions used to de-clad fuel elements) frequently made its way to the burial ground in shielded drums or other shielded containers.

- The procedure (GE-1956) identifies chemicals which are dangerous either because of their corrosive, flammable, or explosive nature, or because of the toxicity of their vapors. The procedure indicates all hazardous materials are not included, but an attempt has been made to list the more dangerous ones of those most likely to be met within the laboratories:

1. **Acids**

- Hydrofluoric Acid (Anhydrous or 48% Solution): Violently corrosive and volatile acid which causes slow-healing burns on contact with the skin and membranes of respiratory passages.

- Fuming Sulfuric Acid: Should be disposed of by adding an equal volume of sulfuric acid.

- Halogen Acids: Concentrated solutions of these acids are corrosive but the principal danger is due to the volatilization of acid vapors which irritate the membranes of the respiratory system.

- Osmic Acid: The vapors are toxic and have an irritating effect on the eyes in low concentrations.

2. **Alkalis**

- Potassium and Sodium Hydroxides

3. **Gases**

In general, gases are hazardous either because of their explosive and flammable nature, their poisonous nature, or because they reduce the amount of oxygen present in the atmosphere to such an extent that it will not sustain life.

- Arsine: One of the more toxic gases, it is being generated by the action of acids on impure metals.

- Hydrocyanic Acid: One of the more toxic of the common gases. The gas is generated by the action of dilute acids on cyanides.

- Hydrogen Sulfide: Ranks close to arsine and hydrocyanic acid in toxicity. The gas is generated by the action of acids on metallic sulfides and is one of the more common laboratory gases.

- Nitrogen Oxides: The nitrogen oxides, with the exception of nitrogen tetroxide, are extremely dangerous due to the fact they lack a characteristic odor which would warn of their presence. Nitric acid and hot, strongly acid solutions of nitrates or nitrites are the principal sources of the nitrogen oxides.

4. Metals and their salts

- Mercury: mercury poisoning from vapors

- Potassium and Sodium: React violently with water and acids, liberating free hydrogen and heat. Small quantities of sodium and potassium alloys (NaK) were used as a heat transfer media in experimental fuel capsules irradiated in the Hanford reactors, the Materials Test Reactor, and the Engineering Test Reactor in Idaho Falls. Post irradiation examination of NaK fuel capsules involved disposal of small quantities of NaK, however, a historical review of NaK disposal practices indicates the common practice of deactivating NaK alloys prior to disposal either by treatment in a heavy alcohol or in some cases, reaction with water (NaK- 2010, GE-1955a, GE-1958, GE- 1960, GE-1962). A summary of references regarding NaK irradiations and NaK disposal practices is provided below.

  Beginning on September 28, 1953, standard operating procedures were in place requiring the deactivation of sodium and potassium prior to disposal. (GE-1953, GE-1956). The 4th Quarterly Report in 1953 (GE-1953a) states techniques were adopted to dispose of NaK by drilling holes in capsule walls under kerosene followed by a rinse in alcohol to remove residual NaK. Several reports summarize the results of post irradiation examinations (PIE) on NaK capsules that were returned to 327 Lab. (after irradiation in MTR) in the time period 1955 through 1957 (GE-1956a, GE-1956b, GE-1957a, GE-1957b, GE-1957c). Each of these reports makes a point to state that the capsules were "uncanned" while submerged in tetraethyl alcohol or tertiary butyl alcohol to passivate the NaK contained in the capsules.

  Quarterly reports also indicate the first NaK capsules fabricated, irradiated and then examined in the 327 Lab were opened while the capsules were immersed in butyl alcohol:
  a) Equipment to assemble the first NaK capsules, and planning for the first irradiation of NaK capsules, took place in 4th quarter 1953 (GE-1953a) and 1st quarter 1954. (GE-1954).
  b) The test specimens to be irradiated were prepared in 2nd and 3rd quarter 1954. (GE-1954a, GE-1954b).

c) Four capsules were charged into MTR February 28, 1955 and scheduled for discharge on March 28, 1955. (GE-1955)
d) PIE begins on two of the four NaK capsules in 327 Lab in 1st quarter 1955. The capsules were opened by twisting off the end while the capsule was immersed in butyl alcohol, after first cutting almost through the capsule wall with a parting lathe. New equipment to open capsules containing samples in NaK without damage to the samples and to safely dispose of the NaK was installed in Cell E, 327 Lab. A parting lathe, other apparatus and provisions to maintain an inert atmosphere above the butyl alcohol bath comprise the system. (GE-1955a)

The hazards involving disposal of reactive metals such as NaK were recognized from the beginning and NaK deactivation prior to disposal was a routine operation, starting with the first NaK capsules.

- The salts of Antimony, Arsenic, Copper, Lead, Mercury, and Silver: These salts are particularly hazardous due to their poisonous nature.

5. Oxidizing Materials

- Perchloric Acid: Must never be used unless under written instruction from the laboratory supervisor. Must always be used in a fume hood. The hood walls should be thoroughly washed at least once a week, due to the possibility of forming explosive compounds by the reaction of Perchloric acid with ammonia and nitric acid fumes.

- Peroxides: Strong oxidizing agents which present a definite fire hazard in the presence of organic matter, such as paper, excelsior, etc.

- Permanganates: Strong oxidizing agents and as such react with easily oxidizable materials, such as organic matter, sulfur, sulfides, etc., to form explosive mixtures.

The 327 Laboratory also had the potential to introduce beryllium to the waste stream as a result of processing irradiated samples of aluminum and Zircaloy-2 clad and end caps containing small (up to about 5 weight %) amounts of beryllium. Zircaloy-2 braze rings containing 5% beryllium were used in the manufacture of N Reactor fuel rods. The beryllium waste stream is primarily in the form of fines resulting from the cutting and polishing of end cap and cladding metallographic samples. These fines were typically captured in the submersion tank drain line filters. Other potential beryllium waste streams include the metallographic polishing discs, dissolver solutions, and remnants of end cap weld samples that were examined metallographically, all of which were normally disposed of in the VPUs. It is possible however, that small quantities of beryllium fines may be included in the 618-10 trenches as a result of laboratory ventilation air filter and ductwork disposal, and clean-up/decontamination activities associated with spills and accidents that occurred in the laboratory.

2.0 The 325 Radiochemistry Laboratory

The 325 Radiochemistry Laboratory construction was completed in 1953. The original mission was to support and to explore improvements in REDOX, improvements in Uranium Metal Recovery Process and perform studies to reduce separations waste to "cribbing tolerance" (lower activity levels). Three larger hot cells were added in the 1959 to1960 construction of the 325-A High Level Radio-Chemical Annex. Other related missions over the lifetime of the 618-10 Burial Ground included development of radioactive lanthanum (Rala) which is used as a tracer gas in non-nuclear test explosions, support for the bismuth phosphate process (until the process was replaced by solvent extraction separations), tritium production, plutonium chemistry investigations and waste solidification. These activities along with development of the PUREX, RECUPLEX, THOREX and Plutonium Recovery facility (PRF) occupied the 325 Radiochemistry Laboratory for the first decade of operation. Based upon a review of radiological surveys of waste shipments it is estimated the 325 Radiochemistry Laboratory contributed approximately 20% of the total waste disposed to the 618-10 Burial Ground.

Activities in the 325 Radiochemistry Laboratory and the 325A High-Level Radiochemistry Annex involved processing highly radioactive materials. These activities and their resultant waste streams include all of the components of the bismuth phosphate, REDOX, PUREX, RECUPLEX, THOREX and metal recovery processes.

The PUREX "mini" operation was a significant source of the laboratory's high level waste stream. Beginning in 1955 PUREX mini operations were conducted in a three sided, lead brick hot cell (cave) believed to first be located in room 4-4B of the laboratory, although over the lifetime of the 618-10 Burial Ground there may have been more than one mini in operation. The mini was used to support development of process flowsheets for recovery of valuable fission products (primarily Cs-137, Sr-90, Ce-144 and Pm-147) and residual U, Pu, and occasionally, Am and Cm from PUREX first cycle acid waste (1WW). High activity wastes from mini operations included fission product decontamination wastes and dissolver solutions which were typically packaged in concreted (and sometimes leaded) 55 gallon drums and disposed of in the trenches at the 618-10 Burial Ground.

The 325A High Level Radiochemistry Annex started up hot on June 30, 1960 with 1WW feed solution in B-Cell. Operations in the three hot cells consisted primarily of pilot scale and small plant size production tests. Fuel reprocessing and radionuclide separation campaigns were typical work activities. Solid waste was removed from the cells starting April 5, 1961. A list of waste shipped from 325A from April 1961 through 1967 was documented in a 325A logbook and is included in the attached timeline. These wastes were disposed to the 618-10 trenches or VPUs (depending on size) during the lifetime of the burial ground. (618-10 operated from March 1954 to March 1962 and from October 1962 to September 1963. It reopened in 1962 to support waste disposal activities while the Vertical Pipe Units (VPUs) and caissons were installed in the 618-11 Burial Ground and closed for the final time after the 618-11 Burial Ground was fully operational. Waste shipments made after September 1963 were sent to 618-11) (WMFS-1997).

In addition, waste streams from the 325 Radiochemistry Laboratory is expected to include chemicals that were used to perform operations within the laboratory. The following lists of chemicals were used from 1953 to 1976 (WHC-1993). Because one cannot distinguish the chemicals that were associated with only post 618-10 activities (after September1963), the following lists identify potential chemicals that could have been associated with the 618-10 wastes. However, usually these laboratory chemicals were used in small quantities, and since any residues have had 30+ years to break down, it is unlikely they remain detectable in unsafe concentrations.

Chemicals Used at Building 325 Analytical Laboratory (1953-1976)

Compound Name	WAC 173-303-100 Category	DOT Classification
Acetone	D	Flammable liquid
Aluminum Nitrate Nonahydrate	D	Oxidizer
Ammonia (Anhydrous)	B	Non-flammable gas, poisonous, corrosive
Ammonium Hydroxide	C	Corrosive
Ammonium Oxalate		
Bromocresol Purple		
Calcium Carbonate		
Calcium Chloride	D	
Carbon Tetrachloride	D	
Ceric Sulfate	C	
Cesium Nitrate	D	Oxidizer
Ethanol		Combustible, flammable liquid
Ferrous Ammonium Sulfate		
Hydrazine	B	Poisonous,corrosive, flammable liquid
Hydrochloric Acid	D	Corrosive
Hyrdofluoric Acid	B	Corrosive, poisonous
Hydrogen Peroxide	C	Oxidizer
Hydroiodic Acid		
Hydroxylamine Hydrochloride		
Iodine		
Iron		
Kerosene		Combustible
Magnesium Oxide		
Mercury		
Mercury Nitrate	B	Poisonous
Methanol	D	Flammable liquid
Methyl Ethyl Ketone	D	Flammable liquid
Methyl Isobutyl Ketone	D	Flammable liquid
Methyl Lactic Acid		

Nitric Acid	C	Corrosive, oxidizer
Nitrous Acid		
Oxalic Acid		
Perchloric Acid	D	Corrosive, oxidizer
Periodic Acid		
Phosphoric Acid	D	Corrosive
Potassium Hydroxide	C	Corrosive
Potassium Iodate		
Potassium Permanganate	D	Oxidizer
Silver Nitrate	D	Oxidizer
Sodium Carbonate	D	
Sodium Hydroxide	C	Corrosive
Strontium Nitrate	D	Poisonous
Sulfuric Acid	C	Corrosive
Tetrasodium Ethylene Diamine-Tetraacetate (EDTA)		
Tetraphenyl Boron		
Thenoyltrifluoroacetone		
Tributyl Phosphate	D	
Trichloroethane	D	Poisonous
Tri-iso-octylamine	D	
Tri-n-octylamine		
Turco Alkaline (Rust Remover)[1]		
Turco Deseal Zit 2[1]		
Vanadium Pentoxide		Poisonous
Xylene	D	Flammable liquid
Zirconyl Nitrate		

[1] Tradename-Turco Products, Inc.

Additional Chemicals Used at Building 325: Pacific Northwest Laboratory Development and Production Laboratory (1955-1976)

Compound Name	EPA Category	DOT Classification
Ferrous Sulfate		
Hydroxylamine Nitrate		
Lanthanum Nitrate	D	
Nitrilotriacetic Acid (NTA)	D	
Normal Paraffin Hydrocarbon		
Pentasodium Diethylene Triamine Pentaacetate (DPTA)		
Sodium Dichromate	C	
Sodium Fluoride	B	Poisonous
Sodium Nitrate	D	Oxidizer
Sodium Phosphate		
Sodium Sulfate		

Trisodium Hydroxyethyl Ethylene-Diamine Triacetate (HEDTA)		
Turco (Fabrifilm)[1]		
Yttrium Nitrate		
Zinc Nitrate		Oxidizer

[1] Tradename-Turco Products, Inc. (formula of Toluene, Butanol, Isopropanol, Acetone)

The report (WHC-1993) indicates the EPA Category in the preceding tables was determined using the *Registry of Toxic Effects of Chemical Substances Quarterly Issue* (NIOSH 1992). Category X marks the most toxic chemicals, followed by Categories A, B, C, and D, listed in order of decreasing toxicity. The DOT classification was taken from the DOT Hazardous Materials Table (49 CFR 172.101).

3.0 The 329 Biophysics Laboratory

The 329 Biophysics Laboratory (formerly Health Instruments and Development Laboratory) opened in 1953. The original mission was to analyze radioactive levels in air, soil, water, vegetation and other bioassay samples. The original mission also included the invention, development and improvement of radiation monitoring instrumentation. Over the lifetime of the 618-10 Burial Ground, other missions included monitoring radioactive fallout from atmospheric nuclear bomb tests, fission product analysis on marine and terrestrial life, and analysis of film build-up on the inside of Hanford production reactor process tubes.

Based upon a review of radiological surveys of waste shipments it is estimated the 329 Biophysics Laboratory contributed approximately 5% of the total waste disposed to the 618-10 Burial Ground. The waste stream consisted of contaminated samples brought in from the field and from chemicals used to separate various isotopes during analysis. The chemicals included:

- Nitric, hydrochloric, hydrofluoric, boric, sulfuric, tartaric acids, sodium thiosulfate, hydroxylamine hydrochloride, ammonium chloride, hydrogen peroxide, sodium sulfate, magnesium perchlorate, aluminum nitrate, sodium fluoride, lanthanum fluoride, sodium iodide, acetone, thenoyltrifluoroacetone, thenoyltrifluoroacetone-benzene solutions, lanthanum nitrate, potassium permanganate, silver nitrate, carbon tetrachloride, cupric oxide, copper nitrate, arsenic nitrate, ferric chloride, zinc nitrate, cupferron, and many other generic and commercial substances. Asbestos sheets were also used as insulators .

- During the 1960's, the 329 Laboratory used formalin, methyl orange, ammonium molybdate, ammonium phosphomolybdate, phenolphthalein; several acids including citric, acetic, and oxalic; many carrier agents such as gallium chloride, strontium nitrate, zirconium nitrate, yttrium nitrate, ferric nitrate; and various carriers for iodine, manganese, arsenic, and other substances (WHC-1992).

The 329 Biophysics Laboratory had performed biological studies involving the affects of radiation fallout on plants, animals and animal tissue. Therefore, it is possible that decayed remains of plant and animal tissue could be contained within the burial ground.

In addition to alpha emitting isotopes, the radionuclides known to be analyzed for in biological samples include: P-32, Zn-65, Zn-69, As-76, Cr-51, Np-239, Sr-90, Cs-137, Co-60, Y (in reactor effluent), I-131, Na-24, Sc-46, Mn-54, Mn-56, Ga-72, Cu-64, Si-31, Tm-170 (WHC-1992). Excluding the alpha emitters and Sr and Cs, the half-life of all the above, including isotopes of Y, is less than one year.

4.0 The 3706 Radiochemistry Laboratory

The 3706 Radiochemistry Laboratory construction was completed in 1945. This facility was the original World War II radiochemistry laboratory for Hanford Engineering Works (HEW). It housed 57 laboratories, 19 offices, 2 shops, a dark room, store rooms, a lunchroom, locker room, ventilating equipment and sanitary restrooms. Lead "brick piles", walls, half walls and hinged stainless steel hoods (fabricated onsite) provided shielding while processing small-scale experiments with low and high-activity radioactive materials in support of the HEW production activities. Hood air was exhausted upward to a single Cold War Service (CWS) filter. Building air was exhausted directly to the atmosphere through roof vents. There was no stack/stack filters.

The original mission included improvements to the bismuth phosphate process, destructive and nondestructive examination of irradiated fuel elements from the production reactors, characterization of fission products and Pu decay products and, equipment decontamination and corrosion studies.

In 1947 the Atomic Energy Commission (AEC) changed the mission of 3706 Building from bismuth phosphate process improvement to development of REDOX process. Subsequent missions for 3706 included continuing support of the REDOX process and pioneering development of the PUREX and RECUPLEX processes. In 1953/1954 the 325 Radiochemistry Laboratory, the 326 Pile Technology Building (later called Physics and Metallurgy Building), the 327 Radiometallurgy Laboratory and the 329 Health Instruments Control and Development Laboratory (currently the Biophysics Laboratory) came on line and assumed much of the work previously performed by 3706. In 1954 the 3706 Building underwent decontamination and remodeling and many laboratories were converted to offices, however, support for fuel fabrication activities continued through 1964 when the majority of its space was devoted to mail services, duplicating, photographic and drafting services, a first aid station, 300 Area patrol headquarters and other administrative functions.

In July 1953 the 3706 Laboratory was used for development of the "concreted" 55 gallon drum. Concreted 55 gallon drums were developed to reduce handling costs and exposure rates to personnel while disposing of liquid wastes above "crib" levels and certain high level dry wastes. These drums were used extensively for disposal of high activity wastes,

primarily from 327 and 325 Laboratories. (See discussion for 327 Radiometallurgy Laboratory above). These drums were disposed of in the 618-10 Burial Ground trenches since they were too large to fit into the VPUs.

During the life time of the 618-10 Burial Ground, wastes from the 3706 Laboratory were composed of chemicals listed above for the 325 and 327 Laboratories, and of all components of the bismuth phosphate, REDOX, PUREX and RECUPLEX processes including Pu, U, Th, Be, and Hg. Based upon a review of radiological surveys of waste shipments it is estimated the 3706 Radiochemistry Laboratory contributed approximately 4% of the total waste disposed to the 618-10 Burial Ground.

5.0 The 326 Physics and Metallurgy Building

The 326 Physics and Metallurgy Building (formerly Pile Technology Building) opened in 1953 with two primary missions. Original mission was to maintain and improve reactor operation and to develop information for design of future plants. The primary physics mission was to conduct sub-critical exponential pile physics development work. These missions employed metallurgical examination of reactor components and fuel elements to evaluate characteristics and performance. This work was performed on unirradiated fuels (natural U or 90% enriched U) and on irradiated metal specimens. (Metalurgical examination of irradiated fuel was performed in 327 Radiometallurgy Laboratory). Nondestructive examination methods such as X-ray diffraction, ion microprobe, and other spectrometry work were the principle means of analysis used in 326 Building. Fuel jacketing process improvement studies included etching experiments and experiments with aluminum-silicon alloys, beryllium-zirconium ratios and other alloys. Plutonium and plutonium oxide fuels experiments were also conducted in the 1960s.

Pile operations produced little environmental contamination. Highly irradiated Co, Cu, and other metallic foils were examined in hoods and lead caves but the physics work generated few liquid radioactive or chemical wastes. Solid radioactive wastes, including high activity foils were sent to the 300 Area Burial Grounds and may have included 618-10. Wastes generated by metallurgical processes consisted primarily of chemicals and heavy metals. Chemicals used in the building included hydrofluoric, nitric, sulfuric, aqua regia, and picric acids. Sodium hydroxide and potassium hydroxide were the principal caustics used in the building along with many reagents and industrial cleansers including carbon tetrachloride (CCl_4), acetone, ethanol, and various commercial products. Waste streams including particulate Al, U and Be in the form of fines and grindings were collected in bag filters before installation of HEPA filters in the early 1960s. These filters, the accompanying ductwork may have been disposed to 618-10. Drums of Al, U and Zr-Be turnings are expected in the 316-10 Burial Ground.

Based upon a review of radiological surveys of waste shipments it is estimated the 326 Physics and Metallurgy Building contributed approximately 2% of the total waste disposed to the 618-10 Burial Ground.

6.0 The 321 Separations Building

The 321 Separation Building, opened in 1944 as the HEW cold "semi-works", or pilot scale plant for testing process improvements using unirradiated or low activity substances. The original mission was to trouble-shoot immediate problems as they developed in the early bismuth phosphate chemical separations plants, T-Plant and B-plant. In 1947 additions to the facility were made and some testing with higher activity radiochemical solutions was initiated. (However, testing with full strength radiochemical solutions was generally conducted in C Plant during these years). Pilot scale tests for the REDOX process were run in the 321 Building. Subsequent missions included pilot scale testing of the Uranium Plant Metal Recovery process, the PUREX process, RECUPLEX process, THOREX process, and fission product separation processes. (WHC-MR-0388)

Based upon a review of radiological surveys of waste shipments it is estimated the 321 Building contributed approximately 1% of the total waste disposed to the 618-10 Burial Ground. The waste stream included the chemicals listed below, and of all components of the bismuth phosphate, REDOX, PUREX, RECUPLEX and THOREX processes including Pu, U, Th, and Hg.

Components of the bismuth phosphate process, included many acids (nitric, phosphoric, hydrofluoric, oxalic, and others), bismuth nitrate, sodium dichromate, potassium permanganate, calcium, lanthanum and sodium fluorides, ammonium fluosilicate, peroxide, sodium hydroxide, and other substances. Components of the REDOX process and its development included methyl isobutyl ketone (hexone), aluminum nitrate, ammonium nitrate, many acids (including nitric, sulfuric, oxalic, and others), ferrosulfamate, sodium hydroxide, mercury, resins and other substances. Components of the metal recovery process and the PUREX process were quite similar to each other and included tri-butyl phosphate, normal paraffin hydrocarbon (a form of saturated kerosene), acids (including nitric, oxalic, and others), ammonium fluoride, ammonium nitrate, and other substances. The RECUPLEX process used tri-butyl phosphate, carbon tetrachloride (CCl_4), many acids (including nitric, oxalic, hydrofluoric, and others), sodium fluoride, sodium hydroxide, and other substances. All of these chemicals became waste constituents of the 321 Building, along with trace isotopes of plutonium, uranium, thorium, strontium, cesium, aluminum, iron, copper, and zinc. Additionally, cell and equipment decontamination reagents, cleansers, and drying materials, including carbon tetrachloride, trichloroethylene, acetone, 2-butanone, and many commercial products became part of the 321 Building waste streams.

7.0 The 309 Plutonium Recycle Test Reactor (PRTR) Building

The PRTR, located within and below the 309 Building was completed in 1960 as the operating test reactor in the HW Plutonium Fuels Utilization Program. Wastes shipped to 618-10 from the 309 facility consisted primarily of low level solid wastes resulting from equipment and facility decontamination campaigns to clean up leaks from valves, pipes and other leaking gaskets. A review of Radiological Survey Records indicates disposal of three concreted drums containing high activity reactor hardware (fuel rod extenders and hanger ends) was made to the 618-10 Burial Ground. Another source of high activity waste originating from the PRTR resulted from analysis of fuel elements that failed in the

PRTR and were sent to the 327 Radiometallurgy Laboratory for evaluation. The failed PRTR fuel elements were sectioned at 327 to obtain the specimens needed for post irradiation analysis. Following analysis at 327, the specimens and remaining sections of the fuel element not used in the analysis were typically returned to the Pu recovery process. Specimens not returned to the Pu recovery process, and the typical wastes associated with processing the samples, was disposed of as part of the 327 waste stream.

Based upon a review of radiological surveys of waste shipments it is estimated the 309 Building contributed approximately 2% of the total waste disposed to the 618-10 Burial Ground.

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ATTACHMENT 2

Activities Timeline for 618-10 Burial Ground

(Note: This chronology does not include a complete listing of shipments made to the burial ground. Many waste shipments (almost daily) were made to the burial ground over its lifetime. The waste disposal information included below was extracted primarily from Radiological Survey Records (RSRs) and monthly reports. However, the majority of RSRs, and some monthly reports made no mention of specific articles being sent to the burial ground and, therefore, are not included herein.)

1943 – The first operating reactor on the Hanford Site was constructed in the 305 Building. The 305 Test Pile was used as a quality assurance tool to test samples of graphite, uranium, aluminum tubes and other materials to be used in the Hanford Engineering Works (HEW) production reactors. The reactor was also used as a radiation source for technical and instrument development work. (WHC-MR-0388, DOE/RL-97-1047)

December 1943 – Fuel manufacturing begins in 313 Building. (DOE/RL-97-1047)

1944 – 321 Separation Building begins operation. (WHC-MR-0388). Based upon a review of radiological surveys of waste shipments it is estimated 321 contributed approximately 2% of the total waste disposed to the 618-10 Burial Ground. (See Section 6.0 of Attachment 1 for a description of facility missions and waste streams.)

Sept 1944 – B Reactor startup. (DOE/RL-97-1047)

December 1944 – D Reactor startup. (DOE/RL-97-1047)

1945 – 3706 Radiochemistry Laboratory Building construction completed. (WHC-MR-0388, DOE/RL-97-1047) Based upon a review of radiological surveys of waste shipments it is estimated 3706 contributed approximately 5% of the total waste disposed to the 618-10 Burial Ground. (See Section 4.0 of Attachment 1 for a description of facility missions and waste streams.)

February 1945 – F Reactor startup. (DOE/RL-97-1047)

April 1945 – B Plant startup (bismuth phosphate separations process). (DOE/RL-97-1047)

1949 – C Plant startup (pilot for REDOX process). (DOE/RL-97-1047)

1949 – 3730 Gamma-Neutron Irradiation Facility was constructed. Initial mission was to house fabrication operations for specialized graphite shapes. Later it was used to store uranium turnings and contaminated materials including ruptured fuel slugs waiting for

analysis in other facilities. It replaced the 3741 Building when that facility was demolished in 1956. Irradiated and contaminated graphite pieces and dusts were the primary waste streams. (WHC-MR-0388). Based upon a review of radiological surveys of waste shipments it is estimated 3730 contributed approximately 1% of the total waste disposed to the 618-10 Burial Ground.

October 1949 – H Reactor startup. (DOE/RL-97-1047)

October 1950 – DR Reactor startup. (DOE/RL-97-1047)

1952 – S Plant startup. (REDOX process) (DOE/RL-97-1047)

1952 – U Plant startup. (Recover U from T and B Plants) (DOE/RL-97-1047)

1952 – 328 Engineering Services and Safety Shop (formerly Machine Development Building, then Engineering Management and Technical Shop in 1960) construction completed. It was constructed to provide craft, equipment and fabrication services for the 300 Area laboratories. Mission was to provide fabrication and servicing of specialized and intricate apparatus and equipment needed by the chemistry, physics, biophysics and metallurgy laboratories in the 300 Area. Wastes and contamination generated in the 328 Building were almost exclusively chemical. Machinery oils, degreasers, paints, glazes, acids, caustics, carbon tetrachloride, trichloroethylene, perchloroethylene, acetone, various alcohols, commercial cleansers and other chemical substances were used in the building over the years. (WHC-MR-0388, WHC-MR-0293) Based upon a review of radiological surveys of waste shipments it is estimated 3730 contributed less than 1% of the total waste disposed to the 618-10 Burial Ground.

November 1952 - C Reactor startup. (DOE/RL-97-1047)

1953 – 326 Physics and Metallurgy Building (formerly Pile Technology Building) opened. (WHC-MR-0388) Based upon a review of radiological surveys of waste shipments it is estimated the 326 Building contributed approximately 2% of the total waste disposed to the 618-10 Burial Ground. (See Section 5.0 of Attachment 1 for a description of facility missions and waste streams.)

1953 – 329 Biophysics Laboratory (formerly Health Instruments and Development Laboratory) opened. (WCH-MR-0388, WHC-MR-0293) Based upon a review of radiological surveys of waste shipments it is estimated the 329 Laboratory contributed approximately than 4% of the total waste disposed to the 618-10 Burial Ground. (See Section 3.0 of Attachment 1 for a description of facility missions and waste streams.)

1953 – 325 Radiochemistry Building construction completed. (WHC-EP-0696) Based upon a review of radiological surveys of waste shipments it is estimated the 325 Laboratory contributed approximately 23% of the total waste disposed to the 618-10 Burial Ground. (See Section 2.0 of Attachment 1 for a description of facility missions and waste streams.)

July 1953 – 327 Radiometallurgy Laboratory accepted by AEC and turned over to GE. (HW-28906). Based upon a review of radiological surveys of waste shipments it is estimated The 327 Laboratory contributed approximately 59% of the total waste disposed to the 618-10 Burial Ground. (See Section 1.0 of Attachment 1 for a description of facility missions and waste streams.)

July 1953 - To reduce handling costs and exposure rates, it was proposed that all liquid waste above "crib" levels and certain high level dry waste be "concreted" in 55 gal. drums. Concreting experiments were performed in July 1953 at 3706 Building. (HW-28906) (Note that the term "high level waste" as used in the 1950s/1960s was based on activity readings at the time and is not the same as the current regulatory definition of high level waste.)

July 1953 – The Zeiss metallograph was installed in 327 Lab and placed in operating condition at C-Cell. Preliminary testing of the Bergman microhardness tester was initiated. Design of a remote handling drill to obtain samples for chemical analysis from radioactive pieces was completed. Design of a three ton cask to be used in conjunction with the high level cell has been completed. The equipment for slug molding and chemical removal of slug jackets was removed from 222-S for installation in 327 Building high level cell B. (HW-28635)

July 6, 1953 – Activation of the machine shop in the 327 Laboratory began. (HW-28635)

July 7, 1953 – A contaminated lathe was removed from 111-B and installed in 327 Lab. The remainder of shop equipment except for the milling machine has been set up to operate by the end of July. (HW-28635)

July 16, 1953 -The first work (in 327 Laboratory) on irradiated material was on a defective vertical safety rod. (HW-28635) (HW-28906)

August 1953 – Slave manipulators were installed in 327 Lab cells B and C (HW-29249)

September 1953 – 327 Standard Operating Procedures issued and includes instruction for deactivating Na and K prior to disposal. (HW-29460)

October 1953 - First pre-formed concrete shielding barrel for use in the 325 Radiochemistry Building was made. Barrel to be used as shielding medium for a one gallon. glass container filled with high activity waste. After gallon container is filled, it will be broken and the core of the barrel will then be filled with cement. Barrel to be disposed of by burying. (HW-29794)

October - December 1953 – First examinations of irradiated fuel elements performed in 327 Radiometallurgy Laboratory (HW-30896)

November 2, 1953 – Report issued documenting the results of a macroscopic examination (performed in 327 Lab) of a failed fuel element irradiated in C-Reactor to an exposure of approximately 455 MWD/T. (HW-29818)

January 1954 – The production test for scavenging of cesium from U recovery waste with nickel ferrocyanide was successful and plans were made to scavenge future wastes. Future 325 Radiochemistry Laboratory work on the subject was directed toward a more simple and effective recovery system. (HW-30724)

February 1954 – Decontamination of the material/equipment for the move from 3706 to 327 began. (HW-31006)

March 1954 – The 300 North Burial ground was accepted for use. Three gloveboxes from 3706 and one from 222-T were disposed of in the 618-10 burial ground since they were too hot to decontaminate. (HW-31267) (However, four radiological surveys (#s 30145, 00193, 91023 & 91043) indicate waste was sent to 300 North Burial Ground prior to March 1954) The first trench, about 25 ft. deep x 50 ft. wide, was dug in March and is about 100 ft. north of the 321 Cribs (the 321 Cribs are located at approximately coordinates S-6000 and E-3500). A second trench dug in the summer of 1955 was not used as of September 20, 1955. (HW-39076)

March 19, 1954 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on three ruptured slugs, clad in 63-S Al alloy, that were irradiated in H reactor to exposures of 215, 297 and 305 MWD/T. (HW-31181)

April 1954 - 327 Radiometallurgy Laboratory performed post irradiation examination on preformed zirconium samples to determine the effect of irradiation on the mechanical properties of the Zr samples after an exposure of 180 MWD. (HW-34820)

April 1954 - Abrasive cut-off machine and the metallographic cell used for first time in the Radiometallurgy Laboratory to process irradiated fuel specimens. Metallographic cell and tensile testing of irradiated samples at room temperature placed in operation. (HW-32236)

April 2, 1954 – Two gloveboxes from 3706 surveyed prior to disposal in 618-10 were estimated to contain an interior content of 10,000 to 50,000 micro-grams Pu each. (RSR-400185-A)

April - June 1954 – Examination of four ruptures of the cap failure type started in the 327 Radiometallurgy Laboratory. Slugs discharged between 4/1/54 and 5/8/54 at 516 to 594 MWD/T. Modifications made to Slug Exam (B) Cell to improve space utilization and contamination control, including installation of a stainless steel floor sloping to a drain containing a glass wool filter in a stainless steel cartridge. (HW-32236). Examination completed 07/54-09/54 (HW-33602)

May 1954 - 327 Radiometallurgy Laboratory performed post irradiation examination on a 1.75% enriched U slug designed to operate at a power level calculated to generate a core temperature in the alpha/beta phase transition range. The 4", alpha rolled, triple dip canned, uranium slug accumulated an exposure of approximately 700 MWD/T in C Reactor before being discharged. (HW-31835, HW-27850) Slug discharged 11/10/53; sectioned; metallography and hardness measurements were conducted in the 327 Radiometallurgy Laboratory. (HW-31835). Exam performed during Nov. – Dec. 1953 (HW-30896)

May 10, 1954 – Special survey of 3 gloveboxes, gloves and paper disposed to 618-10 from 3706, one at east edge of pit, one at south end of pit and one at west side of pit, was performed. Maximum exposure measured was 60 mR/hr contact. (RSR-400195)

May 14, 1954 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on two ruptured slugs that were irradiated to compare pile behavior of triple dipped canned U slugs machined at Fernald to slugs of Symonds production metal. The slugs were irradiated in C Reactor to 560 (discharged 10/7/53) and 488 MWD/T (discharged 10/19/53). (HW-31856) Fracture surfaces cleaned for examination. (HW-31856)

June 1954 - More suitable methods for "cut off" boxes from 327 Building were agreed upon. The unit requires special handling (due to readings up to 500 R/hr. @ 6") to prevent leaching of highly radioactive material to ground. First generation cut off boxes consisted of a metal enclosure containing an abrasive wheel, clamping devise and an air/water filtering system. The cuts were made underwater and a number of different filtering systems were employed to separate the waste sludge from the water coolant. (HW-29128) A decision was made to bury several 15' lengths of pipe (14" dia) vertically at North Burial Ground and to seal the bottom with cement. The cut off boxes will be discarded into these pipes and a wet mix of concrete will be poured into the pipes periodically to encase the units. During interim period of pipe installation, it became necessary to dispose of one of the cut off boxes which was done by concreting the unit in a 55 gallon drum at the burial ground. (HW-32317) (Note that the vertical pipe units (VPUs) of today were referred to as pipes, burial pipes, concrete pipes, waste stand pipes and dry wells in the 1950s/1960s.)

June 1954 –Reports issued summarizing the results of post irradiation examination on ten tubes of slugs discharged from H Reactor at exposures of 1100 to 1600 MWD/T. The purpose of the test was to determine by a "run to failure" method the feasibility of applying closer tolerance on acceptable surface defects to U slugs during the slug fabrication process. Two ruptures; 1 at 1440 MWD/T and 1 at 1530 MWD/T; at least part of this work occurred in the 200 Area; potentially no work on these slugs in 327 Radiometallurgy Laboratory. (HW-32163, HW-34631, HW-41517)

June 7, 1954 - 327 Radiometallurgy Laboratory performed post irradiation examination on 12 diffusion bonded ruptured J-slugs. No indication of whether the slugs failed during

irradiation. A J-slug is 93% Al and 7% U-235 and is used for spike enrichment to increase flux in certain regions of the reactor to flatten neutron distribution. (HW-32059)

June 23, 1954 – Survey conducted at west end of the trench to support boring 3 holes (possibly the first 3 VPUs, see June 1954, HW-32317 entry above) for disposal of 327 cut-off boxes. (RSR-400300)

June 23, 1954 – Bucket containing cut-off sludge from 327 Radiometallurgy Laboratory filled with concrete, 3 R/hr. @ 3' pulled into trench with rope. (RSR-400301)

July – September, 1954 – Exam of the J slug which failed in tube 2868-DR on 07/14/54 was started. Samples were taken from the melted portion of the jacket for metallographic study. Density cell completed and calibrated. Initial steps taken to modify Cell E, which will include a stainless steel tray sealed to the walls that would include a filter connected to the crib liquid waste system. (HW-33602)

July 1954 - Two filter traps from cut off boxes originating in 327 Radiometallurgy Laboratory discarded by concreting in dry wells (VPUs) in the 300 Area Technical Burial Ground (618-10), 400 R/hr. @ 6" (HW-32624, RSR-60920, RSR-60927)

August 1954 – A contaminated cask which had been stored in 3722-A for several years was buried (presumably in 300 North). (HW-32889)

September to October 1954 - 327 Radiometallurgy Laboratory performed post irradiation examination on 2 failed thorium slugs irradiated to 1230 (discharged 4/27/54) and 1650 MWD/T (discharged 9/20/54) in B Reactor. Both slugs were canned in 2S Al jacket. (HW-34088)

September 3, 1954 – Load lugger containing Ru-106 from 329 Building sent to 618-10. (RSR-200289)

September 10, 1954 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on irradiated samples of KEL-F plastic coupons. The purpose of the test was to determine the effect of radiation exposure on the physical properties of KEL-F plastic sieve plates to be used in various PUREX columns. (HW-33029). Load Lugger containing MSA masks and dust stops 3 hoods in 329 Building disposed to 618-10. (RSR-200298)

September 20, 1954 – A waste box containing filters and a sample from "cooking pot" from 329 Building disposed to 618-10. (RSR-200316)

September 29, 1954 - 327 Radiometallurgy Laboratory performed post irradiation examination on the first four of 12 U-Mg fuel material samples that were irradiated in the Materials Test Reactor) MTR. Bend tests and metallography were performed. Wafer cut from each irradiated sample; samples indicated 500 R/hr @ 12.5" in air. (HW-33960)

October 1954 - 327 Radiometallurgy Laboratory performed post irradiation examination on four cored, enriched U slugs (1.75% U-235) that were irradiated in C Reactor to 1550 MWD/T. One slug failed. The slugs were examined to determine if distortion occurred in the non-ruptured slugs and to assess the type of damage that occurred in the failed slug. (HW-33943) PT-105-513-SI; all slugs sectioned for examination; charged sometime after 01/13/54 (HW-30445); discharged sometime after 5/17/54 (HW-31537)

October – December, 1954 – Exam of two cap type failures in progress. Failure No. 376 was discharged 05/27/54 at 540 MWD/T and Failure No. 422 was discharged 12/29/54 at 812 MWD/T. Metallographic exam of irradiated powder metal U slug discharged from 0884-DR on 12/9/52 at 424 MWD/T in progress. [HW-34455]

October 5, 1954 – Waste box containing lead pencils, lead brick and microscope stage disposed to 618-10. (RSR-200348)

October 8, 1954 – Cut off box operation (327 Radiometallurgy Laboratory) resumes after becoming inoperable on August 6, 1954. Waste trap disposed to 618-10, 500 R/hr. @ 6". (RSR-61292)

October 30, 1954 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on 5 ruptured and 6 un-ruptured slugs to determine the cause of an outbreak in cap-type failures in a process test to evaluate the effect of irradiation on U slugs machined from heat treated Fernald rolled rods. Ruptures discharged between 4/1/54 and 5/8/54; unruptured slugs discharged between 11/1/53 and 4/17/54. (HW-33084)

November 1954 - One slug cut off box waste catcher (this is probably a slightly different name for a "gunk catcher") from 327 Radiometallurgy Laboratory was concreted (in a VPU) at burial ground (500 R/hr.). 200 lead bricks transferred from 327 to 325 for use in "laboratory PUREX hot facilities". [Note: This may be another name for the "Mini" referred to in numerous other documents] (HW-33962)

December 1954 - Slug cutoff gunk catcher (based on info in HW-30896 for High Level Examination Cell, it is believed that the "gunk catcher" referred to was initially a disposable, 24 gage galvanized iron tray measuring 12" x 12" x ½" deep designed to retain most of the gross contamination in 327 hot cells) and several cell trap filters from 327 were concreted at burial ground (500 R/hr.). (HW-43147)

December 1954 – KW Reactor startup. (DOE/RL-97-1047)

December 15, 1954 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on four diffusion bonded J slugs that were examined to determine the extent of corrosion and water penetration at the diffusion weld closures. The slugs were irradiated in tube 2374-C for 80 days to an exposure of 718 MWD/T. A J-slug is 93% Al and 7% U-235 and is used for spike enrichment to increase flux in certain regions of the reactor to flatten neutron distribution. (HW-34144)

December 29, 1954 – Report issued summarizing the results of decontaminating four bismuth-beryllium slugs exhibiting a dosage rate of 4 rem/hr. Smearable surface contamination ranged from 3,000 to 40,000 cpm after preliminary treatment in an acid bath. The slugs were decontaminated in the Radiometallurgy laboratory by a succession of acid bath treatments to 100 cpm smearable for an unknown use in the 326 Building. (HW-34261)

1955 - RECUPLEX process begins at 200 W (Z-Plant). (WHC-MR-0293)

January 1955 - A slug cut-off gunk catcher and a cell trap filter were concreted in the 300 Area North pipes (VPUs) (500 R/hr.). Work initiated at 300 North Burial to cover rad waste in the pit with about 18" of dirt. Ten pipes (VPUs) 10' long x 1' diameter. were set vertically to be used for disposal of gunk catchers and other high level waste. Four 55 gal drums containing waste exceeding crib limits mixed with concrete were taken to 618-10. Fuel elements irradiated in MTR by GE-ANP were examined. (HW-34631)

January 1955 - 327 Radiometallurgy Laboratory performed post irradiation examination on two fuel elements containing U-Mg spheres irradiated to 285 MWD/T in the MTR. The elements were designed to achieve 5000 MWD/T, but one failed due to insufficient cooling in the reactor. Both elements were Clad in Zr-2. (HW-46469)

January to March 1955 – 8" solid, ruptured U piece irradiated in tube 3374-C examined; discharged 1/19/55 at 556 MWD/T; 2 transverse wafers. Unbonded slug failure discharged from tube 2686-C on 01/31/55 at 250 MWD/T received for exam. Unruptured piece from tube 2786-C discharged 01/12/55 at 185 MWD/T received for exam. (HW-36054). Eight samples from PT-105-514-SI (irradiated U) were sectioned; (1) piece ¼" long cut from each; additional 1" long piece also cut for density measurements. Exam of entire charge of 38 slugs along with the process tube and central graphite section of Tube 4669 KW in progress after obstruction to cooling water flow during startup. (HW-36054)

January 9, 1955 – Three samples of process tube 4669 KW and 8 slug samples from the same tube were received by 327 Radiometallurgy Laboratory for examination. The inspection was initiated to determine the extent of slug damage which occurred during the incident of January 5, 1955 so that an estimate of the condition of slugs not yet discharged could be made. The incident involved loss of coolant due to a rear face connector stoppage on tube 4669KW. (HW-34403, HW-34631)

January 17, 1955 – Lead bricks from 3741 Building disposed to 618-10. (RSR-51924)

January 18, 1955 – Lead brick and centrifuge base removed from 325 Radiochemistry Laboratory. Max reading on lead brick was 12.5 R/hr. at 2". (RSR-???8)

January 20, 1955 – One milling machine, 1 lathe, 1 cut-off wheel and 1 telephone from 3741 Building were disposed to 618-10. (RSR-51931, RSR-51932, RSR-51933)

January 24, 1955 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on 2 Th slugs irradiated to 1355 MWD/T in tube 3179-D. (HW-34471) Dejacketing and bend testing described in HW-34471 probably occurred at 105-C MEF. Discharged 10/4/54 (HW-33324)

January 27, 1955 – Broken lengths of irradiated graphite transferred from 327 Basin to waste cartons for disposal, 300mR/hr. at surface of cartons. (RSR-61334)

January 28, 1955 – Cardboard box containing plastic bottles of liquid waste from C Cell (metallography cell, sample grinding, polishing and etching), 327 Radiometallurgy Laboratory taken to burial ground. (RSR 61341) The cardboard box container suggests the liquids within the plastic bottles constituted low level waste. Waste solution from PUREX Minature Semi-Works in 325 Radiochemisrty Laboratory loaded into barrel for disposal measured 18.5 R/hr. at 12" in waste line to barrel and 2.5R at 2" through bottom of barrel. (RSR-01878)

February 1955 – KE Reactor startup. (DOE/RL-97-1047)

February 1955 – A slug cut off gunk catcher and a cell filter trap were concreted in VPUs. (HW-34631)

February 1955 – Two slug cutoff gunk catchers from 327 were concreted at the burial ground. (500R/hr. @ 6"). (HW-35530)

February 1955 – Work at 300 North Burial Ground, consisting of covering waste with 18" of dirt and re-stabilization of the bank to permit easier dumping was initiated. Ten pipes, 10' long x 12' diameter are being set in the burial ground. (HW-34631)

February 1, 1955 – Waste box containing pallets from 3730 Building disposed to 618-10. (RSR-51961) (The 3730 Building replaced the 3741 Building and quickly became contaminated as a result of handling/storing/processing of irradiated graphite, flux wires and fuel samples).

February 14, 1955 – Report (poor quality, difficult to read) issued summarizing the results of 327 Lab post irradiation examination on several U-Cr alloy slugs irradiated in D Reactor to exposures of 165, 224, 480,687, and 834 MWD/T. The Cr content ranged between 0.3 and 0.5 atom %. (HW-35189)

March 1955 - Three cutoff gunk catchers and four cell trap filters from 327 were concreted at the burial ground (in VPUs). (500R/hr. @ 6"). (HW-35891)

March 1, 1955 – Waste from removal of lathes in 306 Building disposed to 618-10. (Two lathes decontaminated with Dupanol). (RSR-71078)

March 8, 1955 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on a 310 stainless steel, 30% UO_2 metal fuel plate irradiated in MTR for 100 hours. The purpose was to evaluate in-reactor stability of fuel sheet material with air as coolant media. (HW-35682)

April to June 1955 - Equipment to open capsules containing preformed samples of NaK, without metallurgical or mechanical damage to the samples, and to safely dispose of the NaK has been designed, fabricated, and installed in E Cell (327 Building). All capsules up to the size of a Hanford fuel slug can be opened and the NaK safely disposed of. (HW-37979)

April 1955 – Large amounts of trash from 3706 modifications disposed last 2 months; 20 gallons Th cutting oil waste from Fuel Technology in 303 Area picked up and concreted. Could not be disposed via the 303 system because it has been designated to handle U waste only; solutions containing 80 grams Pu were composited and transported to REDOX plant for return to Process; finger pump installed in 325 Radiochemistry Laboratory Decontamination Room to be used in adding rad liquids to concreting barrels, which will result in greater capacity for waste per barrel since dilution water from aspiration will be eliminated; four slug cut-off and cell filters from 327 disposed of by concreting at 300 N (500 rads/hr @ 6"). (HW-36440 H)

May 1955 – Trench 2 opens (based on educated guess)

May 1955 - Three cutoff gunk catchers and a quart bottle of high level waste from 327 were concreted at the burial ground. (500R/hr. @ 6"). Four barrels of waste exceeding crib limits were concreted at 325 Radiochemistry Laboratory and the barrels were buried at 300 North. Excavation of a new burial pit was completed at 300 North and the area was re-fenced and re-graded. (HW-36928)

May 1955 - June 1955 – Several low exposure slugs had failed during this period but the reference document reported 327 Radiometallurgy Laboratory post irradiation results for 2 failures irradiated to 230 MWD/T (discharged 5/3/55) and 243 MWD/T (discharged 5/13/55). (HW-38030)

May 1955 and October 1955 - 327 Radiometallurgy Laboratory performed post irradiation examination (including sectioning) of two production tests, each containing four U tensile samples canned in NaK-filled Zr-2 capsules irradiated in the MTR to 475 MWD/T (May 1955) and 800 MWD/T (October 1955). NaK was deactivated prior to disposal. (HW-46470) Report issued Nov. 1956

May 11, 1955 – Lathe from 3706 Bldg taken to burial ground. (RSR 91293)

May 16, 1955 – Report issued summarizing the results of 327 Radiometallurgy Laboratory examination of a Parker fitting on tube 2783-B that failed while being tightened to the rear face of the B Reactor to stop a leak. (HW-36720)

June 1955 – Drums of concreted waste were transferred to burial ground with maximum body dose rate of 200 mR/hr. at 3' from a drum showing 2 R/hr. at 2". The maximum dose rate observed during concrete pouring into pipe at 300 North was 5 R/hr., and maximum body dose rate encountered was 200 mR/hr. at 2' from pipe. (HW-37651)

June 10, 1955 – Gunk catcher from 327 Radiometallurgy Laboratory to burial ground. (RSR 91342)

June 16, 1955 – Filters and liquid waste from 3706 to burial ground. (RSR 91360)

June 23, 1954 – A bucket containing a concreted cutoff box from 327 was pulled into trench with ropes, 3R/hr. at 3'. (RSR-400301)

June 29, 1955 – 600 gallon tank from 321 Bldg containing Shell spray base sent to 300 North. (RSR-1309)

July 1955 - Sept. 1955 – Failure No. 360, discharged 05/3/54 at 694 MWD/T, exam in progress (HW-39495)

July 14, 1955 – Gunk catcher from 327 to burial ground. (RSR 624035)

July 18, 1955 – Filters from 327 to burial ground. (RSRs 624050, 91401)

August 1955 - Routine waste removal from 327 Radiometallurgy Laboratory to 300 North burial ground entailed a max dose rate of 5 R/hr. at 2" from the load lugger and 40 mR/hr. in the truck cab. The max rate during burial was 5 R/hr. at 10'. A fire in the 300 North Burial Ground on Aug 15 consumed all exposed flammable material. HW-54636 states fire was 8/16/55 and particulate matter was spread out 1500' in a northeast direction. Particle frequencies ranged from 0.5/100 $ft.^2$ to > 4/100 $ft.^2$. Readings were from 35,000 to > 85,000 cpm with an isolated max of 4.5 R/hr. (HW-54636). (Figure showing contamination spread was attached to document). Fire was put out by bulldozing dirt into pit. (HW-38828) (Thorium waste from Bureau of Mines at Albany OR was received for burial and went to 200 West Burial Ground since 300 North was not usable due to fire. (HW-38846) (RSR-01621)

August 1955 - 327 Radiometallurgy Laboratory performed post irradiation examination on one ruptured J-slug irradiated in DR Reactor. A J-slug is 93% Al and 7% U-235 and is used for spike enrichment to increase flux in certain regions of the reactor to flatten neutron distribution. Discharged from 1064-DR on 7/23/54. (HW-40358)

August 3, 1955 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on a 310 stainless steel metal fuel plate irradiated in MTR for 200 hours. The purpose was to evaluate in-reactor stability of fuel sheet material with air as coolant media. Three samples examined sectioned from a Nichrome V clad fuel element; irradiated for 200 hours. (HW-38560)

August 24, 1955 – 50 gallon drum of liquid waste from 325 Radiochemistry Laboratory to burial ground. (RSR 01663)

September 1955 – Trench 3 opens (based on educated guess)

September 1955 – An old uranium oxide burning furnace stored behind 314 Building was removed to the 303 Burial Ground. A PoBe source was transferred to 305-B. Routine work with irradiated graphite and aluminum continued at 326 and 3741 Buildings with a dose rate of 3.5 R/hr @ 3 ft. experienced during removal of a waste box from 3741 to the burial ground. Processing of dissolver solution from REDOX and Hot Semi-Works in the 325 Minature Purex Hot Semi-Works, in Room 4-4B, encountered rad levels of 100 R/hr. at top of waste drum during removal of waste from cell. In room 7-4F (325 Building), a lead brick cave in which work with thorium, irradiated protactinium, and dissolver solution had been processed, was partially dissembled resulting in contamination of the room. Irradiated thorium samples were processed in room 6-4C (325 Building) at radiation levels up to 20 R/hr. @ 2 inches. The highest dose rates encountered during 325 Building waste handling were those on waste from the Minature Semi-Works. A dose rate of 15 Rad/hr. was observed during transfer of solution from a cask into a concrete drum. Pouring of concrete caps for the drums entailed a maximum dose rate of 600 mR/hr. to the hands and 150 mR/hr. to the body. A spike solution of Zr-95 was brought to 321 Building from REDOX. A 2 Ci Co-60 source was used in room 15-C of 329 Building for calibration purposes. A shipment of thorium waste from the Bureau of Mines, Albany, OR was disposed in 300 North trench. (HW-39257)

September 1955 - Eight barrels containing miscellaneous waste that exceeded cribbing waste limits were concreted and buried at 300 North pit. Three slug cut off filters from 327 were concreted at 300 North (500 R/hr.). Half of the month's effort at 325 Radiochemistry Laboratory was taken to support PUREX studies being conducted by the Chemical Research Sub Section. The studies involved experimenting with different decontamination agents to remove fission products of Zr - Nb, Ru - Rh in the PUREX dissolver solution from the U and Pu. (HW-39260)

September 2, 1955 – Waste from 1171 Road House, including brake shoes, air hoses and a battery (unknown type) disposed to 618-10. (RSR-01717)

September 22, 1955 – Two trenches opened at 618-10. (WCH-125)

October 1955 - A special transfer cask was used to transport waste to the 300 North Burial ground on a trial basis. The cask cuts down exposure at 327 but requires about 12 more trips to the burial ground per month. Use of the cask also requires setting new concrete pipes at the burial ground to contain the waste discharged. (HW-39751)

October 18, 1955 – Gunk catcher containing liquid waste from 327 Radiometallurgy Laboratory disposed of in VPU. (RSR 91547)

October 25, 1955 – Barrels (unknown quantities) of liquid waste (unknown source) disposed of in burial ground. (RSR 02032)

November 1955 - Work started on second pipe field at 300 North. This field consists of about 20 culvert pipes set vertically in ground. High level waste will be discharged into these pipes and wet mixes of concrete added. Experience has shown this to be an economical and safe method of high level waste disposal. Work order issued to cover boxes in 300 N with dirt to lessen fire hazard and reduce field readings which are becoming quite high in the vicinity of the pit. (HW-40182) Pu Spectrochemical Lab in 325 Radiochemistry Laboratory completed. (HW-39958)

November 8, 1955 – Gunk catcher from 327 Radiometallurgy Laboratory to burial ground. (RSR 91574)

November 11, 1955 – Gunk catcher from 327 Radiometallurgy Laboratory to burial ground. (RSR 91583)

November 15, 1955 – Report was issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of three cored slugs that were irradiated in tube 1378, C Reactor as part of a test to compare performance of cored vs. solid slugs. One cored slug had failed and 2 slugs, adjacent to the failed slug, did not fail. Tube exposure was 1129 MWD/T. The slugs were 4 ", natural U, alpha rolled, beta treated with a drilled 3" core. Discharged 3/23/55; metallurgical studies, including sectioning, of rupture and adjacent downstream slug. (HW-39943)

November 16, 1955 – Two "hot slugs" from 327 Radiometallurgy Laboratory to burial ground. (RSR 91608)

November 17, 1955 – Gunk catcher from 327 Radiometallurgy Laboratory to burial ground. (RSR 91609)

November 22, 1955 Trash including batteries (unknown type) from 1171 Building disposed to 618-10. (RSR-00125)

December 1, 1955 – Cell filters from 327 Radiometallurgy Laboratory transported to burial ground and disposed of in shielded box. (RSR 91622)

December 7, 1955 – Aluminum cuttings from 3741 packaged in waste cartons disposed of in trench at burial ground, 4 R/hr. @ 4". (RSR 51856)

1956 – B Plant shutdown. (DOE/RL-97-1047)

1956 – UO_3 Plant startup. (DOE/RL-97-1047)

1956 – A glovebox from 3706 was disposed of. (WCH-125)

1956 – First phase of Metal Fabrication Development Building, 306-W, construction completed. (WHC-MR-0388)

1956 – Three of several failed production slugs irradiated in KW were examined in 327 Radiometallurgy Laboratory. The failures occurred in less than 1 year. Exposures were 595 (failed 4/29/56), 668 (failed 5/6/56) and 753 MWD/T (failed 5/11/56). (Report was not issued until January 1958) (HW-54581) Exam of 668 and 753 MWD/T slugs completed 09/1956. (HW-46066)

January 1956 – A Plant startup. (PUREX process) (DOE/RL-97-1047)

January 1956 - Several hundred mL of dissolver solution from PUREX brick pile (mini cave –an open top hot cell surrounded by lead bricks within 325 Radiochemistry Laboratory) was disposed of by concreting in a Pb shielded barrel. Four barrels containing miscellaneous rad waste exceeding crib limits were concreted and disposed of in the 300 North Burial Ground. Unknown amount of hot waste from 327 hauled to 618-10 and placed in burial pipes. Building 3741 was dismantled and the walls and the foundation of the building were dumped into the 300 North Burial Pit. (The 3741 building was used to store and prepare samples of irradiated graphite, flux wires and uranium from the 305 reactor. It contained lathes, drills, saws, and other equipment for opening, sectioning and preparing samples for analysis in the 3706 Building. Due to high radiation levels, 3741 was torn down and replaced by 3730 Building). The covering of waste in the burial ground was completed. The west bank of the pit was stabilized with rock fill. The access road to the burial pit was improved by hauling in additional gravel. (HW-41205)

January 12, 1956 – Two concreted barrels containing solid waste from 326 Lab. measured 1 R/hr. at 2" through side of barrel. (RSR-02369)

February 1956 - Two trips made to 300 North with hot waste from 327 gunk catcher. Readings were 5 R/hr. at 12 feet. Disposal made in burial pipes. (HW-41702)

March 1956 - Six trips made to 300 North with waste from 327. Readings on the gunk catchers were 5 R at 6'. Four barrels containing hot waste were concreted and hauled to 300 North. Readings were 2 R at the surface. (HW-42219)

March 1, 1956 – Lathe from 327 Building disposed to 618-10 Burial Ground. (RSR-626406)

March 5, 1956 – Barrel from 325 Radiochemistry Laboratory containing waste resulting from decontamination of PUREX Mini Cave (open top hot cell surrounded by lead bricks within 325) measured 1 R at 2". (RSR-02598)

March 12, 1956 – Two barrels from 325 Radiochemistry Laboratory containing PUREX Mini Cave waste measured 500 mR/hr. at 2". (RSR-02635)

March 21, 1956 – Waste from 2 Pu samples, gloves, tweezers and paper waste from 326 Building disposed to 618-10. (RSR-52056)

April 1956 - Examination rate of metallography cell in the 327 Radiometallurgy Laboratory estimated at 4 samples per week. (HW-42390)

April 1956 - Seven trips from 327 to 300 North made. Gunk catcher reading 5R @ 6'. Four barrels containing hot waste concreted and disposed at 300 North. Cement fill added to burial pipes. (HW-42626) Examination rate of metallography cell estimated at 4 samples per week. (HW-42390)

April 1956 – Revision 1 of 327 Radiometallurgy Laboratory Standard Operating Procedures issued (maintains requirement for deactivating Na and K prior to disposal). (HW-29460)

April 1956 – 327 Radiometallurgy Laboratory performed post irradiation examination on a prototype 2 rod, natural U fuel element cluster, clad in 304L stainless steel to determine the in-reactor stability of the proposed cluster type design. The cluster was successfully irradiated in H Reactor to 110 MWD/T. (HW-46472)

April 3, 1956 – "Hot waste" (box of aluminum) from 3730 Building disposed to 618-10. (RSR-52078) (The 3730 Building replaced the 3741 Building and quickly became contaminated as a result of handling/storing/processing of irradiated graphite, flux wires and fuel samples).

May 1956 - 300 North burial pit partially covered to reduce fire threat and high rad readings. East bank of pit then stabilized with additional gravel fill, and is now in use. Four loads of gravel were used to provide a roadbed for the construction of a new pipe field in 300 Area. (HW-43137)

May 1956 – 327 Radiometallurgy Laboratory performed post irradiation examination on alloys of U-Si, U-Cr and U-Ti, and 2 natural U capsules. Capsules were NaK bonded and irradiated in MTR to 2.7E+20 NVT. Purpose was to determine irradiation stability and irradiated tensile properties of sample types. NaK was deactivated prior to disposal. (HW-46468)

May 1, 1956 – A uranium cylinder from 327 Radiometallurgy Laboratory (size unknown) reading 50 mR/hr. was disposed to burial ground. (RSR-91825)

May 2, 1954 – Gunk catcher from 327 Radiometallurgy Laboratory disposed to 618-10, 500 R/hr. @ 6" (RSR-91828)

May 7, 1956 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of twelve U-Mg fuel samples irradiated in the MTR to exposures of 1,000, 5,000, 10,000 and 20,000 MWD/T. The samples were 0.4"diameter x

1.5" long, canned in Zr-2. Bend tests were performed on the samples and on un-irradiated control samples to measure the affect of irradiation exposure on the physical properties of the material. (HW-42652)

June 1956 - 327 Radiometallurgy Laboratory performed post irradiation analysis on two cored, insulated 4" uranium slugs irradiated to 220 MWD/t in the MTR. The purpose was to determine the effect of irradiation on the dimensional stability of this fuel type. (HW-49007)

June - December 1956 - 327 Radiometallurgy Laboratory performed post irradiation examination to determine the effects of irradiation on the physical and mechanical properties of five samples of KAPL powder metallurgy uranium-magnesium (65 volume % U) fuel material. The samples were irradiated in the MTR to exposures of 2.5E+20 (two samples) and 7.5E+20 NVT (3samples). All samples were clad in 2-S Al alloy (HW-51208)

June 1, 1956 - 327 Radiometallurgy Laboratory performed post irradiation analysis on the M-338 Al alloy jacket taken from a fuel element irradiated to 86 MWD/T in H-Loop. (HW-46471)

June 20, 1956 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of one ruptured cap type slug and two non-ruptured cap type slugs irradiated in H Reactor to exposures of 754, 659 and 622 MWD/T, and one non-ruptured cap type slug irradiated in DR Reactor to an exposure of 720 MWD/T. (HW-42940)

July 1956 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of one process tube from D Reactor, seven from F Reactor, and six from H Reactor (HW-44792)

July 18, 1956 – Shielded drums (unknown quantity) from 325 Radiochemistry Laboratory containing PUREX Mini liquid waste measured 1.5 R/hr. at 2" through side of drums. (RSR-03297, RSR-03298)

July 25, 1956 – Report issued summarizing the results of 327 Radiometallurgy Laboratory examination of three uranium wafer slugs irradiated in the MTR to exposures of 700 to 900 MWD/T. The slugs were 4" long, internally and externally cooled and Al jacketed. Report date is 7/25/56. Received in 327 01/1956 about 3 weeks post-discharge; wafers removed from all three slugs and burn-up analysis also performed on samples from all three. (HW-43761)

August 1956 – Decontamination personnel made three trips to 300 N with hot waste from 327. Readings on waste were as high as 15 R at 10'. (HW-45115 H)

August 1956 – 327 Radiometallurgy Laboratory performed post irradiation analysis on two, half inch diameter, U-Al diffusion couples immersed in NaK and sealed in a

Zircaloy capsule. The capsule was irradiated to 5.2E+19 NVT in the MTR. Irradiated diffusion rates were compared with out-of-reactor diffusion rates. (HW-47935)

August 1956 – 327 Radiometallurgy Laboratory performed post irradiation analysis on uranium tensile specimen irradiated in the MTR to 185 MWD/T to determine the effect of high temperature irradiation on the post irradiation properties of uranium. The sample was canned in a NaK filled Zr-2 capsule. NaK was deactivated prior to disposal. (HW-49002)

August 6, 1956 – Contaminated, waste graphite from 326 Lab disposed at 618-10. (RSR-52262)

August 7, 1956 – A "plant made" oven (HEW-445198) from 326 Building was disposed in 618-10. (RSR-52264)

August 29, 1956 – A sample polisher from 327 Decon cell, reading 140 mR/hr., was prepared for burial. (RSR-528041)

September 1956 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of 5 process tubes from B Reactor, 2 from F Reactor, and 5 from H Reactor. (HW-45919)

September 1956 – 327 Radiometallurgy Laboratory performed post irradiation analysis on two natural U cored slugs. No reactor or exposure given. (HW-54352) Tensile testing of Nat. U sample exposed for 6 days in MTR (185 MWD/T); samples for burn-up determination cut from U tensile specimens exposed to about 150, 300 and 600 MWD/T at HAPO (HW-46066)

September 1956 – On ten different occasions waste was removed from 327 to burial grounds via load lugger. Maximum dose on lugger was 5 R/hr. at 6" and driver dose was less than 50 mR/hr. (HW-45736)

September 11, 1956 – Containers with liquid C-14 and dry Sr-90 from University of Washington disposed to 618-10. (RSR-03628)

September 18, 1956 - Report issued summarizing the results of examination of 4 process tubes from B Reactor, 7 from C, 4 from DR, 11 from F, 5 from H, and 9 from D Reactor (HW-45602)

September 26, 1956 – 327 Radiometallurgy Laboratory performed post irradiation analysis on an Al-Si bonded, cored thermocouple slug irradiated in the MTR for one cycle to a U-235 burn-up of 0.011 atom %. (HW-58100)

October 1956 – Exam of 3 recent failures from KE began; 1st slug failed 9/2/56 (HW-45717) in tube 4573-KE @ 500 MWD/T; sectioning performed; exam of 100-H hot spot rupture (failed 9/6/56 @ 376 MWD/T) (HW-46727-DEL); both exams continued into

December 1956 (HW-47858); 4573-KE exam complete 02/1957 with 3rd wafer taken and metallurgical exam performed.

October 1956 – 1st of 3 enriched 4" cored slugs irradiated under PT-105-607-A-57MT examined; broken in two at 105-C MEF; 1st slug discharged at 703 MWD/T; sectioned near center (HW-46727-DEL)

October 8, 1956 – Hood filters from 329 Biophysics Laboratory disposed to 618-10. (RSR-00060)

October 10, 1956 – NaK waste reading 200 mR/hr. was removed from E Cell (327 Radiometallurgy Laboratory) to waste cask. (RSR-528341)

October 12, 1956 – A 75# pig containing a bottle of "hot" (8 R/hr.) waste from 325 Radiochemistry was disposed of in VPU. (RSR 03847)

October 17, 1956 – Waste box containing calcium sulfate from 329 Building disposed to 618-10. (RSR-00081)

October 24, 1956 – Irradiated aluminum in waste box disposed to 618-10, 5R/hr. (RSR-528525)

November 1956 – Construction of a new burial pit in 300 N Burial Ground completed. Contaminated waste in old pit pushed down and the ground from the new pit was used as cover material. (HW-47155).

December 1956 – Contaminated waste at 300 North Burial Ground pushed down into pit. Additional gravel fill brought in to stabilize the banks of both pits. All work completed and both pits are available for use. (HW-47782)

December 7, 1956 – Failure from 3654-KE (442 MWD/T) received in rupture can (HW-47858); failed 12/5/56 (HW-47615-DEL); very fine and extremely radioactive U oxide dust ejected from can during removal effort in 327 B Cell (HW-47657); ejected material passed thru hot cell filter and into building stack; stored for further examination after additional radioactive decay; removed from rupture can by dissolution in NaOH which also removed the Al jacket.

January 1957 – High level waste removed from 327 Radiometallurgy Laboratory cut-off cell and B cell and immediately transported to burial ground. After removing waste, unshielded portion of cell measured 100 R/hr. Stirrers and samples removed from "Mini" in 325 Radiochemistry Laboratory (HW-48045)

January 1957 – Work on failure from 4771-KE (664 MWD/T) started; work resumed on 3654-KE, but unable to remove from rupture can (HW-47943-DEL); 4771-KE failed 9/2/56 (HW-45717)

January 1957 – 3rd of 3 enriched 4" cored slugs irradiated under PT-105-607-A-57MT examined; transverse wafers taken (HW-47943-DEL)

January 7, 1957 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on a 310 stainless steel 30% UO_2 metal fuel plate irradiated in MTR for 69 hours. The purpose was to evaluate in-reactor stability and fission fragment retention of fuel sheet material with air as coolant media. (HW-47136)

January 16, 1957 – Three waste drums from 340 disposed 618-10. (RSR-200104)

January 22, 1957 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of one ruptured and two non-ruptured fuel slugs irradiated in C Reactor to exposures of 598 (rupture; two transverse wafers taken), 549 (transverse wafer taken) and 573 MWD/T (transverse wafer taken). The slugs were Ni bonded and natural U. (HW-43800)

February 1957 – 327 Radiometallurgy Laboratory performed post irradiation examination on one I&E uranium wafer slug irradiated in the MTR to a U-235 burn-up of 0.097 atom %. The slug was Al-Si bonded and M-388 jacketed. (HW-55520) Eight inch slug discharged 1/7/57 at 800 MWD/T. (HW-47943)

February 15, 1957 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on a 310 stainless steel 30% UO_2 metal fuel plate irradiated in MTR for 200 hours. The purpose was to evaluate in-reactor stability and fission fragment retention of fuel sheet material with air as coolant media. (HW-35682, HW-48490)

February 18, 1957 – Four lathes mounted on timbers disposed to 618-10. Building origin not known. (RSR-200472)

April 1957 - 327 Radiometallurgy Laboratory performed post irradiation examination on two I & E, natural U fuel capsules, clad in Zircaloy, and irradiated in MTR to 145 MWD/T. (HW-60176)

April 1957 – Exam of both 4573-KE and 4771-KE ruptures completed (HW-49752-DEL)

April 15, 1957 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of two fuel elements and a piece of Zr process tube discharged from H Reactor subsequent to a rupture occurrence. Rupture occurred 10/31/55; 360 MWD/T exposure; two slugs examined at 327 were located (1) immediately downstream of rupture and (2) at the end of the charge. Report for exam of elements issued 08/56; report for exam of process tube issued 06/56. (HW-43588, HW-43577, HW-43064) Examination of elements and tube in progress Jan – Mar 1956 (HW-42390)

April 30, 1957 – MSA hood filters from 329 Biophysics Laboratory disposed to 618-10. (RSR-509126)

May 1957 – 327 Radiometallurgy Laboratory performed post irradiation examination on a prototype 4 rod, natural U fuel element cluster, clad in 304 stainless steel. The cluster was irradiated in MTR to 550 MWD/T. Discharged 5/6/57; longitudinal and transverse sections removed from 1 rod for metallurgical studies and 1 sample from midpoint of each rod. (HW-57377)

May 13, 1957 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of a HAPO sized, Al canned, U-Mg slug irradiated in the MTR to an exposure of 800 MWD/T. The U was enriched to 1.75 % U^{235} with a Mg matrix containing approximately 1% Si. Received 12/14/56; slug sectioned near midpoint and wafer examined metallographically. (HW-50185)

June 1957 - 327 Radiometallurgy Laboratory performed post irradiation examination on two I & E UO_2 fuel elements, clad in anodized Al M-388 alloy, that were irradiated in MTR to one MWD/T, One failure was traced to a defective weld. (HW-60178)

June 1957 – A contaminated waste carton form 327 Radiometallurgy Laboratory was inadvertently placed in a clean load lugger and was taken to the 300 North Burial Ground. (HW-51189)

June 1957 – An explosion in 321 A Cell during dissolution of U turnings and fines in nitric acid caused evacuation of several buildings and much U contamination in the canyon. (HW-51189)

June 1957 – Irradiated thermocouple wires from 3730 Bldg to 618-10. Max dose 9 R/hr. @ 4 ' (HW-51189)

June 7, 1957 – Three barrels of contaminated waste, 2 railroad wheels from 1171 Building disposed at 618-10. (RSR-?80280)

July 1957 – 327 Radiometallurgy Laboratory performed post irradiation examination of a capsule containing thorium and 2.1 weight % oralloy (enriched uranium containing 93.5% U^{235}) irradiated to 1 atom % burn-up in the MTR. Attempts to obtain density within 1 ½ months of discharge unsuccessful due to excessive radiation induced thermal heating of submersion bath liquid. (HW-53414)

July 2, 1957 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on 2 slugs irradiated to determine the behavior of slug jackets made of Ni-Al M-388 alloy compared with the standard M-329 alloy. The slugs were irradiated in H Reactor to exposures of 937 and 914 MWD/T. Discharged 4/7/57; M-388 slug sectioned; one wafer polished; 2 transverse and 1 longitudinal section examined. (HW-51207)

July 9, 1957 – 327 Radiometallurgy Laboratory performed post irradiation examination of a failed M388 Al alloy jacketed slug irradiated to 300 MWD/T in D Reactor. The examination objectives were to determine the role the M388 alloy may have played in the failure and determine the uranium core condition. Failed in tube 3578-D on 07/4/57; slug sectioned in rupture area and near both ends. (HW-53254)

July 16, 1957 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of 3 process tubes from B Reactor, 1 from C, 6 from DR, and 1 from KE Reactor. (HW-51410)

August 8, 1957 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of 3 process tubes from D Reactor, 2 from F, 3 from H, and 2 from KW Reactor. (HW-51872)

August 21, 1957 – Report issued documenting the results of 327 Radiometallurgy Laboratory post irradiation examination of NaK filled capsules irradiated in MTR. NaK was deactivated in tertiary butyl alcohol prior to disposal. (HW-51973)

August 22, 1957 – Glass tubes containing waste Pu from 325 Radiochemistry Laboratory packed in I.C. Cartons and plastic, disposed to burial ground. (RSR-381421)

August 26, 1957 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on 2 high temperature, single plate fuel elements irradiated with air as coolant in the MTR. The examination was to evaluate the stability of the fuel sheet material with air as the cooling media. (HW-52052)

August 28, 1957 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of one ruptured, Al clad fuel slug that failed (January 31, 1955) after an exposure of 222 MWD/T in C Reactor. Shipped to 327 four days after discharge; sectioned both longitudinally and transversely (2 wafers). (HW-52301)

August 29, 1957 – a sludge containing Al with U chips in 80% nitric acid from 327 Radiometallurgy Laboratory prepared for disposal. (RSR-412273)

September 1957 – Waste removed from the decontamination cell at 327 Radiometallurgy Laboratory to a load lugger yielded dose rates of 1 R/hr. with one spot at the rear of the load lugger reading 60 R/hr. at 2". (HW-52849)

September 17, 1957 - 327 Radiometallurgy Laboratory performed post irradiation examination of two 304 stainless steel clad, seven rod cluster elements irradiated to 1075 MWD/T in KE Reactor. None of the rods had failed. (HW-55360) Eight inch long by ½" diameter; 4 rods sectioned to secure samples for metallurgical and burn-up analysis. Discharged 07/57 (HW-51703)

September 20, 1957 – Waste from University of Washington disposed to 618-10. (RSR-830231. (Type of waste unknown but see September 11, 1956 above)

October 1957 - Trench 4 opens (based on educated guess). It is believed that this trench was expanded during its operation because of the angled nature of the trench in the southwestern area.

October 1957 – Intermittent work consisting of enlarging the 300 North Burial ground is being performed by Minor Construction personnel. Dosage rates to remove the fence adjacent to the waste trench averaged 10 mR/hr. High level waste was removed from 327 to North Burial Ground due to removal of equipment and decontamination of C Cell. Flash exposures of 10 R/hr. at 6' from load lugger were experienced. (HW-53465)

October 1957 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination on four preformed, depleted uranium (0.028% U^{235}) tensile samples canned in NaK filled Zircaloy capsules. The samples were irradiated in the MTR to exposures of 3.2E+19 (2 samples) and 3.0E+20 NVT (2 samples). The samples were opened in tertiary butyl alcohol. (HW-52876)

October 1957 – Exam of split rupture from 1178-KE (RM 202); 5 transverse wafers removed for metallurgical and hardness testing; 3 wafers etched (HW-52859 A1); failed 8/12/57 at exposure of 236 MWD/T. (HW-52053)

October 21, 1957 – Load Lugger fro 321 Building containing drums of sand from a drain in Tank Farms disposed to 618-10. (RSR-501245)

November 1957 – Extremely high level waste (filter box from 327 cut-off cell) was removed and transported to burial ground. Driver received 800 mR/hr. dose. (HW-54027)

November 26, 1957 – An unknown quantity of cyanide powder was disposed. (RSR 810114) Metal ferricyanides and ferrocyanides (e.g., nickel, zinc) were used in 300 Area labs, primarily from 1956 to 1957, for recovery of Cs-137 from waste. These cyanide containing compounds are much less toxic than simple cyanide salts, but exposure to sunlight can result in generation of HCN.

December 1957 – The 300 North Burial Ground was stabilized with a maximum dose to equipment operator of 180 mR/hr. A remote dissolver system was placed in operation in B-Cell. Irradiated U wafers were dissolved and the aliquot portion transferred to 325 for analysis. (HW-54408)

December 1957 - 327 Radiometallurgy Laboratory performed post irradiation examination on a failed enriched fuel element irradiated to 184 MWD/T in KE Reactor. The element was enriched to 0.94% U^{235} and clad in aluminum. Lab specimens were scheduled to be returned to the process after December 1, 1958. Failed 12/25/57; transferred to 327 six days after discharge; two wafers sectioned (RM 218). (HW-55691)

December 2, 1957 – A truckload of contaminated asphalt from 321 Bldg. was disposed of at burial ground. (RSR 501310) Based on HW-53465 this was fission product contamination, primarily Ru-103 and Ru-106

December 4, 1957 – Piping debris, suspected to be old vacuum lines from 3706, were disposed to 618-10. (RSR-830316)

1958 – Evolution from aluminum to zirconium clad metal fuels, Zircalloy 2 environment with NaK, nickel plating of clad. (HNF-EP-0649)

1958 – Co-60 source reading 200 R/hr. sent to 325 Lab for disposal. (RSR-320160)

1958 – 1968 – 327 Bldg provided surveillance and rupture/failure analysis for fuel elements and materials for PRTR. (HNF-EP-0649)

January 1958 – Report written in January 1958 covers the results of a 1956 327 Radiometallurgy Laboratory post irradiation analysis on three failed production natural U cored slugs. No reactor or exposure given. (HW-54352)

January 1958 - 327 Radiometallurgy Laboratory performed post irradiation examination on a failed, M-388 jacketed uranium slug irradiated in H Reactor to 486 MWD/T Failure occurred at the cap-uranium interface. Discharged 12/3/57; wafers sectioned at hot spot and at 1 ½" from cap end (RM 219) (HW-55635)

January 1958 – Exam of seven-rod cluster fuel element (PT-IP-46-A) irradiated in a KE Reactor through hole to 1075 MWD/T completed (HW-54760 A1) (See September 17 1957 entry)

January 1958 – Exam of cored slug from IP-30-A (RM 192) and C Reactor split failure (failed 03/57) (RM 185) occurring (HW-54760)

January 16, 1958 – HW-54581 issued for exam of 3 ruptured, standard production slugs from KW Reactor. Failed April and May 1956; (RM-149)

February 1958 – Removal of pipes and valves from 321 A-Cell revealed the presence of Nb-95, Cs-137, Ru-106 and Ce-144. The pipes were sent to the burial ground. (HW-55169)

February 1958 – 327 Lab performed post irradiation examination on 2 aluminum process tubes (#s 2169 and 3681) from C Reactor. The specimens were scheduled for disposal after December 1, 1958. (HW-57588)

February 1958 - 327 Lab performed post irradiation examination on an M-338 clad slug which had failed in KE Reactor after an exposure of 588 MWD/T. The purpose of the test was to continue the evaluation of M-388 alloy as a replacement for the 1245 Al alloy.

Discharged 1/6/58 at 453 MWD/T; received 02/58; sectioned at 2", 4", 4 ¾" and 5 ¼" from female end; wafer from melt area metallurgically examined. (HW-55964, HW-50141)

February 10, 1958 – Project Proposal CGH-790, "High Level Radioactive Material Receiving and Storage Addition – 327 Building" issued. Allows for the canyon of the 327 Building to be enlarged to allow handling, decontamination, and storage of irradiated materials of larger physical size and higher radiation levels. Scheduled beneficial use date was June 1960. Work completed July 1960. (HW-54882, HW-63249, HW-66237)

March 1958 – U Plant shutdown. (DOE/RL-97-1047)

March 1958 – Seventeen loads of contaminated waste were taken to burial ground from 327. Max exposures ran up to 20 rads/hr. (HW-55537)

March 1958 - Project CG-660 completed, increases metallography cell throughput from 4 samples per week to 15 samples per week. (HW-55590, HW-42390)

April 1958 - 327 Radiometallurgy Laboratory performed post irradiation examination on one vibratory compacted, 2.4% enriched UO_2, fuel element, clad in M-288 Al alloy, and irradiated in MTR for one cycle to 750 MWD/T. (HW-60183)

April 1958 – 286 barrels of depleted U from University of California were disposed in 300 North. (HW-55940)

April 1958 – Exam of KE Reactor regular 8" M-388 jacketed rupture from IP-80-A (RM 224); transferred 4/2/58; sectioned to remove 3 wafers (HW-55905); probably failed 2/14/58 (HW-55101-DEL)

April 11, 1958 - Report was issued summarizing 327 Lab results of post irradiation examination on a standard fuel element (solid natural U, jacketed in 1245 Al alloy) irradiated in F Reactor to 749 MWD/T. The slug was discharged from the reactor on March 22, 1956. (RM-142) (HW-55692)

May 1958 – A fire in burial ground resulted in moderate particulate contamination being deposited in immediate vicinity of the burial ground. Thirteen loads of contaminated waste were taken to the burial ground from 327 with maximum dose rate of 6 R/hr. Radioactive waste resulting from drilling and machining a graphite block at 326 Building was disposed of by burial in a box with readings up to 5 R/hr. at the side of the box. (HW-56205) Slug racks from Water Basin in 327 Bldg reading 3 R/hr at surface were removed to contaminated waste. (HW-56205)

May/June 1958 – 327 Radiometallurgy Laboratory performed post irradiation examination on a failed enriched fuel element irradiated to 528 MWD/T in KE Reactor. The element was enriched to 0.94% U^{235} and clad in aluminum. Lab specimens were scheduled to be returned to the process after December 1, 1958. Failed 2/25/58 (HW-

57447). Exam of enriched I&E failure from tube 3784-KE continued 06/58 (RM 218) (HW-56640)

June 1958 – Trench 5 opens (based on educated guess)

June 1958 – Exam of ruptured M-388 clad BNTL slug from IP-81-A (RM 228) in progress; tube 3376-DR; exposure of 410 MWD/T. (HW-56640) Failed 3/10/58 (HW-50152 D)

June 1958 – Two failed, Nat. uranium, I&E elements from KE reactor (3051-KE and 3655-KE) received after average tube exposure of 425 and 605 MWD/T; at least two wafers sectioned from each element (HW-56640). 3051-KE failed 5/7/58 and 3655-KE failed 5/15/58. (RM-237) (HW-56184-DEL)

June 1958 – Grossly contaminated Pu gloveboxes were wrapped, boxed and removed from the 325 Radiochemistry Laboratory and placed in the 300 North burial trench. The 300 North burial trench was covered and a new trench dug. Ten loads of contaminated waste were taken to the burial ground with a maximum dose rate 12 R/hr. at unloading. (HW-56550)

June 1958 - 327 Radiometallurgy Laboratory performed examination on seven sections of a "gun barrel" removed from 105-F. The "gun barrel" had offered resistance to removal from the reactor. Some corrosion was evident but the difficulty in removal was attributed to interference with a projection located in a supporting member. The samples were held for 6 weeks, then disposed of. (HW-60858)

June 10, 1958 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of 8 process tubes from D Reactor, 1 from B, 1 from H, 7 from KE, and 5 from KW Reactor (HW-56327)

June 23, 1958 – Design work on Project Proposal CGH-790, "High Level Radioactive Material Receiving and Storage Addition-327 Building" was initiated. (HW-56640)

June 26, 1958 – Contaminated (150 mR/hr.) dirt and debris from 327 Building (likely from Project CG-682) disposed to burial ground. (See September 30, 1958 entry for description of CG-682.) (RSR-860132)

June 30, 1958 – Contaminated (5 to 15 mR/hr.) dirt and debris from 327 Building (likely from Project CG-682) disposed to burial ground. (RSR-860129)

June 30, 1958 – Contaminated dirt and debris (6 mR/hr.) from 327 Building (likely from Project CG-682) disposed to burial ground. (RSR-860166)

July 1958 – On several occasions waste was moved from the 325 Radiochemistry Laboratory to the 300 Area North Burial Ground with dose readings up to 13.7 R/hr. Waste removed from "Mini" reading 1.7 R/hr. at 1' over waste barrel; use of Pb shielding

on barrel reduced max reading to 470 mR/hr. Work completed on several 1WW samples (PUREX waste stream after removal of U and Pu) with observed dosage rates up to 21 rads/hr including 4 r/hr. Twelve waste shipments made from 327 to 300 North Burial Grounds with readings up to 8 R/hr. Pu contaminated fish from 329 Biophysics Laboratory were disposed of in accordance with procedure. More concrete chipped with air hammers and sludge in bottom of 327 water basin, reading 5 R/hr at 3", was removed as part of CG-682 work. (HW-56941)

July 21, 1958 - Contaminated dirt (<100 cpm) from 327 Building (likely from Project CG-682) disposed to 618-10 burial ground. (RSR-860153)

August 1958 – I&E, enriched fuel element rupture from tube 0957-C shipped to 327 on 8/8/58 for exam; irradiated to 865 MWD/T; failed 7/6/58 (HW-56911 and HW-57225); sectioned 9/58 (HW-57636)

August 1958 – 327 Radiometallurgy Laboratory performed examination of I&E, natural fuel element rupture from tube 3849-KE completed 8/58; irradiated to 624 MWD/T; failed 5/10/58 (HW-57225)

August 26, 1958 – The first waste container from 325 Radiochemistry Laboratory was disposed to a VPU (250 mR/hr., ice cream carton). Hood, which at one time contained Pu, removed from former "Hot Lab" in 321 during 08/1958 (HW-57608)

August 28, 1958 – Liquid and solid rad waste from University of Montana likely disposed to 618-10. RSR-293135

September 1958 – A maximum dose rate of 10 R/hr. was measured while unloading a cask at the burial ground. Placement of rocks and sand in the burial column holes reduced the dose rate at 4' from 5 R/hr. to 10 mR/hr. (HW-57608)

September 4, 1958 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of an outbreak of slug failures that occurred in the KE reactor during September and December, 1956. Four ruptured slugs were examined during 1956 and 1957. All were clad with 1245 Al alloy and exposures were 422, 560, 664 and 743 MWD/T. (HW-57353) Refer to Oct. 1956, Dec. 1956 and Jan. 1957 entries for details on these slugs.

September 5, 1958 – Rupture piece from tube 4985-KW, discharged 8/15/58, sent to 327 for exam (HW-57359). 8" I&E Nat. U; Exposure = 770 MWD/T (HW-57278-DEL)

September 9, 1958 – Duct work and a melting pot was shipped from 314 Bldg for disposal at 618-10. HW-57068 states that the second vacuum melt furnace was buried in the uranium burial ground, which was 618-4

September 15, 1958 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of a ruptured I&E fuel slug irradiated in KE

Reactor to exposure of 528 MWD/T. The slug was clad in 1245 alloy. Fuel was enriched to 0.94% U^{235}. Ruptured 2/25/58; examined May/June 1958; transverse section cut; specimens from slug stored in 327 scheduled to be returned to process after 12/1/58 unless 327 notified. (HW-57447)

September 15, 1958 - 327 Radiometallurgy Laboratory performed post irradiation examination on a failed, natural U fuel element irradiated to 627 MWD/T in KE Reactor. The element was clad in aluminum. Lab specimens were scheduled to be returned to the process after November 1, 1958. Failed 5/20/58; two sections removed. (HW-57448)

September 30, 1958 – Physical Completion Notice issued for Project CG-682, "High Level Examination and Cut off Cell". (HW-58019) The shielded cell (4' 6" x 9' 6"x 7' 6" high), allows processing of heavier, more highly radioactive fuel elements (and at greater through-put rates than the lead brick enclosure that it replaced). Shielding is 18" of high density cast iron. (HW-45618, HW-50692) Initial sectioning of an irradiated element did not occur until 10/8/59 (refer to entry for that date).

September 30, 1958 – Graphite casings and other hot waste reading up to 10R/hr. was disposed to 618-10. (RSR-310635)

October 1958 – Waste exhibiting a dose rate of 15 R/hr. was taken from 3706 to North Burial Ground. Casings removed from graphite samples in the 3730 Building were taken to the burial ground. (HW-58054) (The 3730 Building replaced the 3741 Building and quickly became contaminated as a result of handling/storing/processing of irradiated graphite, flux wires and fuel samples)

October 1958 - 327 Radiometallurgy Laboratory performed post irradiation examination on 2 of the rods from 1 cluster fuel element irradiated to 2,000 MWD/T in KER Loop 3 recirculation test facility. Clad was stainless steel. Purpose of the examination was to determine the dimensional stability and changes in the microstructure of the uranium. (HW-62880) Discharged 7/3/58 and received 10/17/58; 2 transverse wafers and 1 longitudinal section from one rod; 1 transverse section from other rod; burn-up analysis performed using 1 wafer, 2300 MWD/T (HW-64444)

October 15, 1958 – Contaminated dirt and debris (300 mR/hr.) from 327 Radiometallurgy Laboratory (likely from Project CG-682) disposed to burial ground. (RSR-860220)

October 21, 1958 – Contaminated dirt and debris (150 mR/hr.) from 327 Radiometallurgy Laboratory (likely from Project CG-682) disposed to 618-10 burial ground. (RSR-860226)

October 22, 1958 – Contaminated dirt and debris (5 mR/hr.) from 327 Radiometallurgy Laboratory (likely from Project CG-682) disposed to 618-10 burial ground. (RSR-860227A)

October 23, 1958 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of 2 process tubes from C Reactor, 4 from D Reactor, 2 from DR, 1 from F and 3 from H Reactor (HW-57887)

October 23, 1958 – Contaminated dirt and debris (up to 350 mR/hr.) from 327 Radiometallurgy Laboratory (likely from Project CG-682) disposed to 618-10 burial ground. (RSR-860228, RSR-860228A)

October 24, 1958 – Contaminated dirt and debris (up to 800 mR/hr.) from 327 Radiometallurgy Laboratory (likely from Project CG-682) disposed to 618-10 burial ground. (RSR-860229, RSR-860229A)

November 1958 – The stock pile of contaminated dirt from Project CG-790 (Rad material and Storage Addition) was taken to burial ground with average dose rate of 5 mR/hr. Gravel was placed over the general area to reduce the possible spread of contamination. Sample lines installed inside "Mini" (HW-58256)

November 1958 – Two I&E Nat. U fuel elements (ruptures) received for exam (RM-252); sectioned (4985-KW and 4259-KE) (HW-58244). Irradiation was 770 MWD/T and 729 MWD/T; failed 8/15/58 and 8/24/58 (HW-57278-DEL)

November 1958 – I&E Enriched U fuel element received and sectioned (2582-C) (HW-58244). Irradiation was 661 MWD/T; discharged 8/9/58 (HW-57278-DEL)

November 1958 – Two pieces of U that would not dissolve in PUREX under normal operating conditions examined, including sectioning (HW-58244).

December 1958 – Excavation and removal of contaminated dirt from (327 Radiometallurgy Laboratory) Project CG-790 continued through completion of the project in June 1960. (HW-58645, HW-66237)

December 1958 – I&E element, 1.6% enriched U wafers, received for exam; ½ of element sectioned longitudinally and being polished (HW-58661, RM-258). Irradiated to 725 MWD/T and discharged 6/28/58 (HW-64444).

December 1958 – Exam of I&E Nat. U production element that ruptured (4259-KE) continued; slug sectioned to remove a wafer 1" from rupture area (HW-58661)

December 1958 – Exam of I&E enriched element from 2582-C continued; longitudinal and transverse sectioning (HW-58661)

December 16, 1958 – Antimony-beryllium source from 3745B disposed to 618-10 at 170 mR/hr. (RSR-836602) (The 3745B Building was used for calibration of radiation detection instruments).

1959 – 1965 – 327 Building provided examination of PuO_2 – UO_2 fuels and higher enrichment fuels, and of stainless steel cladding. (HNF-EP-0649)

January 1959 – Trench 6 opens (based on educated guess) RSR indicated a trench was being backfilled and another was being dug.

January 1959 – An explosion (caused by ignition of acetone fumes) occurred in the hood of the cut-off box in 327, B-cell. A truck driver received 600 mR/hr. while hauling waste from 3706 to burial ground. (HW-59076)

January 1959 – A truck driver received 600 mR/hr. while hauling waste from 3706 to burial ground. Contaminated basin vacuum hose sprayed with Krylon and taped for disposal. (HW-59076)

January 1959 - 327 Radiometallurgy Laboratory performed post irradiation examination on a ruptured 1.6% enriched uranium rod clad with Zr-2 tubing by co-extrusion. The rod was irradiated in a NaK filled Al capsule in the DR Reactor to an exposure of 450 MWD/T. Discharged early 11/58; exam began 01/59; two ½" wafers sectioned; sample removed for burn-up analysis and submitted to Analytical operation. (HW-62603)

January 1959 – Project CGH-804, "Ceramic Fuels Press Enclosure – 325 Building" completed with minor exceptions. An annex to the basement of the 325 Lab was built to house a 300 ton hydraulic press as part of the Ceramic Fuels Development Operation. (HW-55891, HW-59099)

January 6, 1959 – RSR indicated a trench was being backfilled and another was being dug. (RSR-204966)

January 9, 1959 – Lead shielded waste box from 327 Radiometallurgy Laboratory disposed to 618-10, 100 R/hr. (RSR-410195)

January 30, 1959 – 160 barrels of depleted uranium from Rocky Flats disposed to 618-10. (HW-59107)

February 1959 – Condemned narcotics were disposed. No indication of type, form or quantity. (RSR-290177) Significant amount of work in 325 Bldg concerning Pu contamination in basement and two labs (HW-59405)

February 1959 - 327 Radiometallurgy Laboratory performed post irradiation examination of two co-extruded, Zr-2 clad, natural U, seven rod fuel clusters irradiated to a calculated exposure of 1250 MWD/t in KER. The fuel elements were New Production Reactor (NPR, N-Reactor) candidate fuels and exam was performed to evaluate performance to the date discharged. Elements discharged 1/16/59 and received at 327 2/25/59. 1 met sample and 1 burn-up sample from each of 3 rods; density samples (2) from 2 rods. (HW-62426)

February 5, 1959 – Load Lugger (from 3706 Building) with barrels of spent U from Rocky flats disposed to 618-10. (RSR-800025)

February 10, 1959 - 327 Radiometallurgy Laboratory performed examination of an Al shroud from the Engineering Test Reactor (ETR) that developed a crack. The crack was attributed to a bad weld. (HW-59818)

March 1959 – A flash exposure of 25 R/hr. at 7'was recorded during removal of 327 Radiometallurgy Laboratory waste from the cask to the burial ground. High rad level waste being removed from B Cell in 327. Contaminated control valves removed from cave in 325. Tank trailer gaskets at 340 Bldg removed and replaced. (HW-59859)

March 1959 - 327 Lab performed post irradiation examination on a seven rod cluster of 0.499" diameter x 8" long, 1.3% enriched fuel elements clad in stainless steel and irradiated to 35,000 (??) MWD/T . (HW-62229, PT-IP-123-A)

March 1959 – Exam started on 4-rod Zr-2 clad Al-Pu alloy fuel element irradiated to about 2,000 MWD/T (IP-186-A) (HW-59717). Discharged 12/27/58 (HW-64444)

March 17and 18, 1959 - Load of contaminated lumber (20 mR/hr.) disposed to 618-10 burial ground. (RSR-59072, RSR-59075)

March 18, 1959 – 33 barrels of depleted uranium from University of California disposed to 618-10. (HW-59930)

April 1959 – Routine removal of dry and liquid waste from 325 completed with dosage rates up to 17 R/hr at container surface and 1 R/hr. at 2". All CWS basement filters in 325 changed. (HW-60225)

April 1959 - 327 Radiometallurgy Laboratory performed post irradiation examination on one of eight Zr-2 jacketed, natural U, seven cluster, elements irradiated to 200 MWD/T in the KER to determine flow channel temperature characteristics. (HW-60754) PT-IP-221A; RM 287 (HW-60754). Discharged 2/4/59 (HW-64444)

April 14, 1959 – Project Proposal CGH-860, "Access for PRTR Fuel Elements" issued. Allows for modifications to 327 Building High-Level Examination and Cut-off Cell (A Cell) to be enlarged to accommodate sectioning PRTR fuel elements. Scheduled completion date is April, 1960 when first PRTR fuel shipment is expected. Facility became operational in August 1960. (HW-59772, HW-62497, HW-66644)

April 15, 1959 – Project Proposal CGH-858, "High Level Utility Cell, 327 Building" issued. Allows for increasing capacity of radiometallurgical tests by adding a new cell with remotely operated lathe, milling machine, NaK processing equipment and other miscellaneous equipment. Construction completed 5-15-62. (HW-59889, HW-63273, HW-68549, HW-72739, HW-73905)

April 16, 1959 – Ruptured 8" M-388 clad element from KE received at 327; exposure = 813 MWD/T; several sections initially cut and at least 3 additional cuts (transverse) (HW-61185). Failed 2/28/59. (HW-59456).

April 23, 1954 – Sawing tests conducted at 325 Radiocheminstry laboratory to study potential for fire due to pyrophoric nature of Zr filings. (HW-60233) Waste disposed of in concreted drums (RSR-205958)

April 30, 1959 – Ruptured 8" M-388 clad element from 2765-B received at 327 for exam and determination of cause of failure; exposure = 203 MWD/T; transverse and longitudinal cuts made (HW-60870). Failed 3/31/59. (HW-59840).

May 1959 – HW-60181 issued for exam of one I&E 8" UO_2 element canned in M-388 and irradiated for one cycle in MTR; returned to 327 10/57; sectioned; work completed 01/58.

May 19, 1959 – Contaminated asphalt from 327 disposed of. Dose rate of 160 R/hr at 1" observed thru side of waste carton after removal of waste from B cell (HW-60548)

May 26, 1959 – Report issued for exam of 1 four-rod cluster element irradiated to 2200 MWD/T; extensive metallography and burn-up analysis (HW-60520). Work completed 02/59 (HW-59463). Discharged 11/9/58 (HW-64444).

June 1959 – Work performed on Am-241 material (1 g mass) in 325. A drag line crane was used to re-arrange dry waste at the 300 North Burial Ground. Some dry waste cartons were broken and contamination inside the fence between the burial standpipes was detected up to100,000 c/m. Fixed contamination up to 30,000c/m was detected on the crane bucket. (HW-60914)

June 1959 - 327 Radiometallurgy Laboratory performed post irradiation examination on 0.0005 Ni plated, Al clad, natural U, internally and externally cooled, Hanford production fuel element to determine the behavior of the Ni plating. The slug (un-failed) was irradiated to 499 MWD/T in the C Reactor (HW-62441)

June 1959 - 327 Radiometallurgy Laboratory performed post irradiation examination on 4 seven rod cluster elements (PT 214-A, RM 295) irradiated to 1500 MWD/T in KER Loop 2. The clusters were 1.6% enriched U-235 coextruded in Zr-2 cladding and were discharged because of a suspected failure. (HW-63900) Discharged 3/24/59; received for exam on 6/5/59; failed rod examined in detail; 3/8" wafer cut; longitudinal cut through end cap; transverse cut thru failure area; metallurgical exam. Four, 13" long 1.6% enriched U Zr-2 clad 7-rod clusters received at 327 (HW-60846)

June 10, 1959 – Glovebox and steel tank were disposed of. RSR-860015 does not identify origin of glovebox or tank. Steel tank may have been the temporary tank used for wet storage of fuel elements during the construction of the High Level Radioactive

Receiving and Storage Addition to the 327 Bldg. Steel tank was initially used May 1958 removed in March 1959 according to HW-56205 and HW-59859, respectively.

June 15, 1959 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of a ruptured fuel slug irradiated in tube 4074-KE to exposure of 465 MWD/T. The slug was clad in M-388 alloy. Failed 1/3/58; transferred to 327 4/2/58; sectioned to remove wafers. (RM 224) (HW-60157)

June 22, 1959 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of a ruptured fuel slug irradiated in tube 2765-B to exposure of 203 MWD/T. The slug was clad in M-388 alloy. (HW-60870) Refer to previous April 1959 writeup.

July 1959 – While covering waste standpipes in 300 North, dose rates up to 4R/hr. at 30" were obtained. The rate was reduced to 50 mR/hr. at 30" after covering the waste with sand and cement. During removal of low level waste from 327, B-Cell, an irradiated Zr tube sample was mistaken for Al tubing and was pushed from the cell into the waste carton. The maximum dose rate was 110 R/hr. through the 1" steel shield surrounding the carton. Transfer of the carton to the burial ground was accomplished by use of a dummy disposal cart from 100-F Area. Initial use of the "milk pail" cask for disposal of high level waste resulted in contamination of the milk pail exterior and subsequent contamination of the cask slide when the milk pail was disposed of at the burial ground. This experience resulted in the standard procedure of using plastic to cover the exterior of the milk pail until the pail is removed from the cell. (HW-61354)

July 1959 – Nat. U I&E element from tube 2762-D sectioned in badly pitted area again (HW-61374)

July 20, 1959 – Report was issued summarizing 327 Radiometallurgy Laboratory results of post irradiation examination of a failed, M-388 clad fuel element irradiated in KE to an exposure of 813 MWD/T.) Refer to April 1959 writeup. (HW-61185)

August 5, 1959 – Report issued, *Fuel Element Development Committee-GE-HAPO Summary Report Year Ending September 1959,* states that during the previous year the fuel rupture frequency at HAPO reactors was cut approximately in half and it was estimated that 90 to 100 failures could be expected in 1959 even though reactor power levels and exposure rates are expected to continue increasing. (HW-61409)

August 21, 1959 –Lead cave dissolving facility in 325 decontaminated. Bottom section of an ice cream carton (in 325) containing a small vile of dilute Pu solution found to be saturated while being moved. Ground adjacent to 300 N stabilized with maximum dose rate of 100 mR/hr. near burial stand pipes. Gaskets and hose clamps replaced at 340 Bldg. (HW-61731)

September, 1959 –Lead cave dissolving facility in 325 decontaminated further. Two small casks, each containing 1.5 g Pu-238, received in 325. Work involving liquid waste

completed; hand dosage rates did not exceed 1.5 R/hr., including 300 mR/hr. at about 10" from piglets. Waste removed from B cell with dose rate of 20 R/hr. at 1" through bottom of milk pail cask (HW-62123)

September 1959 - 327 Radiometallurgy Laboratory performed post irradiation examination on natural U, Zr-2 coextruded, seven rod cluster fuel element with swaged and welded end closures. Emphasis was on the end closure integrity. The fuel element was irradiated to 400 MWD/T in KER-1. Shipped to 327 9/16/59. (HW-62612) Discharged from KER Loop 1 on 06/28/59 [HW-64444]

September 4, 1959 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of 1 process tube from B Reactor, 2 from C, 5 from D Reactor, 8 from DR, 5 from F and 3 from H Reactor (HW-61746)

September 23, 1959 – "Hot condenser and dip tube placed into waste carton then into load lugger for disposal. 1.5 R/hr. (RSR-412852)

October 1959 – A chemical explosion in 327, E-Cell occurred during processing of a NaK capsule. Extensive contamination of the canyon and personnel occurred. It was theorized the some of the NaK did not react with the butyl alcohol causing ignition of trapped alcohol fumes. Work with radioactive fuel elements in 308 Building, Plutonium Fuels Pilot Plant, was initiated on a limited scale. (HW-62589)

October 8, 1959 – Hood in 325 contaminated from bottle containing Pm-147 cleaned. High level waste samples removed from cask in 325 Decon room and placed in concrete barrels for future burial ground disposition. Initial use of High Level Exam and Cut-Off Cell in 327 to cut inner core of 3' tube-in-tube element (1week after discharge) designed for N Reactor (exposure about 400 MWD/T; HW-62587). Exhaust filter replaced after cuts made. Barrels of DU shipped from Pleasanton CA on more than one truck unloaded at 300 N (HW-62589)

October 13, 1959 - 327 Radiometallurgy Laboratory initiated post irradiation examination on 2 failed, cored, 1.44 % enriched fuel elements (tubes 3472-C and 4080-C). For reasons unknown the examination was not completed (PT-IP-30A). (HW-62371, HWN-1796) Transferred to 327 in Oct. 1957 (HW-53299). 3472-C failed 3/28/57 and 1080-C failed 3/23/57 (HW-49205)

October 19, 1959 – Report was issued documenting post irradiation examination results of 3, 36" Zr-2 clad, unalloyed, 1.47% enriched U, tube-in-tube fuel elements irradiated in KER Loop facility in support of NPR program. These elements survived only 3 weeks of operation before a rupture occurred. Exposure of 310 MWD/T (HW-64444). One of these elements was subjected to examination in the 327 Radiometallurgy Laboratory. Elements discharged 10/1/59; one inner tube sent to 327 for exam; 4" section containing failure cut from tube; more detailed exam not possible at this time because activity is too high for handling in the Metallography Cell. (HW-62428)

October 26, 1959 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of a failed, I&E natural U, production fuel element irradiated to 352 MWD/T in KW Reactor. (HW-62585) RM 305; failed 4/20/59; transverse sample cut at about 4 ¼" from cap end and about 25% of U from sample fell out after cut was made. Exam started 08/59 (HW-61702)

November 1959 – Initial use of the Gatling Gun cask resulted in spread of smearable contamination to 4000 c/m. (HW-63873)

November 1959 - 327 Radiometallurgy Laboratory performed post irradiation examination on a Zr-2 clad, 2.42% U^{235}, 23 ½" long enriched uranium dioxide fuel element that was purposely defected by drilling a 0.005" hole in the cladding. The element was irradiated in the MTR to a calculated exposure of 16 MWD/T and discharged. It was examined to determine the irradiation stability of Zr-2 cladding and the uranium dioxide fuel in a defected element. Discharged 9/16/59; sectioned. (HW-64683)

November 12, 1959 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of two self supporting fuel slugs irradiated in B Reactor to exposures of 821 and 849 MWD/T. Received 07/59; section thru center of supports on each end. (The self supporting fuel slugs have Al ribs fastened to the outside of the fuel slug to center it in the process tube). (HW-62731)

November 12, 1959 – Report was issued summarizing 327 results of post irradiation examination of two direct cast core fuel elements irradiated in C Reactor to an average exposure of 689 MWD/T. Received at 327 during July 1959; 3 sections from one element and one section from other. (HW-62732)

November 30, 1959 – Project Proposal CGH-829, "325 Building Basement Improvements" complete. The project expands work space and improves facilities (electrical, ventilation) to accommodate upcoming work for PRTR and UO_2 development. (HW-60903, HW-62899)

December 1959 – During a transfer of high level radioactive waste to 300 North, jelly from an improperly loaded milk pail was deposited on the inner surface of the trailer bed chute. The slippery surface caused the pail to strike the edge of the burial pipe and fall to the ground. After remotely placing the can in the burial pipe, readings up to 650 mR/hr. at 10" were obtained near the pipe. Exhaust filter from new lead cave in 325 removed for first time with dosage rates up to 800 mR/hr. at 2". (HW-63308)

December 1959 - 327 Radiometallurgy Laboratory performed post irradiation examination on 2 Al jacketed fuel element failures irradiated in KER Loop 3 to a 6 atom % burn-up. Discharged 7/11/59; transverse sections. (RM 402) (HW-62953, HW-60244)

December 7, 1959 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of a natural uranium, I&E, fuel element clad in X-8001 aluminum alloy. This element was selected for detailed examination out of several elements because it exhibited excessive pitting. The fuel element was irradiated in tube 2762-D to an exposure of 886 MWD/T and discharged in February 1959. (HW-63009) Covered in earlier write-ups. RM 303; received 5/5/59; two transverse sections; sectioned again in 07/59. (HW-61374)

December 9, 1959 – Variac parts (HEW 42491), Balance (HEW 12113), and Republic Instrument (HEW 42491) from 321 Building disposed to 618-10. (RSR-502403)

December 17, 1959 – Contaminated Al tubing reading 8.6 R/hr. at 1" prepared for disposal. (RSR-418672)

December 23, 1959 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of high density, sintered, centerless ground, UO_2 fuel element clad in 304L that failed in MTR just after reaching full power. (HW-63184)

1960 – Plutonium Fabrication Pilot Plant, 308 Building, completed. (WCH-0388) Most waste from this facility was shipped to 200 Area for disposal. (HW-64591) Based upon a review of radiological surveys of waste shipments it is estimated the 308 Building contributed less than 1% to the total waste disposed to the 618-10 Burial Ground. (See entry for March 1960 below for additional information)

1960 – Project CA-749, "High Level Radio Chemical Facility" (325-A High Level Radiochemistry Annex) complete. (WHC-EP-0696). Beneficial use of 325-A declared on November 3, 1959. Physical Completion Notice issued December 15, 1959. (HW-50272, HW-55451, HW-63303)

1960 - 327 Facility expanded to nine hot cells (7 cast iron, 2 Pb brick) to provide additional examination capabilities. Expansion to 11 hot cells occurs in early 1963. (HNF-EP-0649)

1960 – The cardboard boxes and gunk catchers were replaced by the remote handled milk pails, paint cans, and juice cans. These containers were remotely loaded into lead shielded casks for transport to the burial ground and remotely released into the VPUs. The aluminum milk pails collected wastes and a commercial gelatin was used to seal the top of the pail. (D&D-23840, HNF-19805)

1960 to 1970 – Mission of 325 Lab expanded to include NASA space program support, new programs using radioisotopes for medical purposes, FFTF, LMFBR and Vitrification Project support . Developed new techniques to separate or fractionalize specific isotopes from high-level waste by ion exchange, carrier precipitation (using metallic ferri and ferrocyanides), solvent extraction and various combinations of these and other methods. Feed material was generally PUREX first cycle waste and Shippingport nuclear plant spent fuel. (WHC-MR-0388, WHC-EP-0696)

1960 – 1988 – 327 Bldg provided surveillance and rupture/failure analysis for fuel elements and materials for N Reactor and pressure tube safety enhancement project. (HNF-EP-0649)

January 1960 – Final report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of two additional self supporting fuel slugs irradiated in B Reactor to exposures of 812 MWD/T. (The self supporting fuel slugs have Al ribs fastened to the outside of the fuel slug to center it in the process tube). (HW-63500, HW-62731) Refer to Nov. 12, 1959 entry.

January/February 1960 –Twelve CWS filters changed in 325 basement. Two items used for alpha decontamination in 325 found contaminated and discarded. High level waste removed from a hood in 325. E cell filter (327) changed. Uranium exhaust ducts removed in 325 basement. (HW-63710)
January 12, 1960 – Zr turnings from 328 sent to burial ground (RSR-655)

January 13, 1960 – Zr turnings from 328 sent to burial ground (RSR-667)

January 22, 1960 - Five containers of zirconium turnings and UO_2 powder was disposed of. (RSR-789)

February 1960 – A severely corroded process tube from DR Reactor was examined by 327 Radiometallurgy Laboratory (HW-64612)

February 1960 – 327 Radiometallurgy Laboratory performed post irradiation examination on a seven rod, 1.6% enriched U cluster fuel element made up of 0.030" wall Zr-2 clad and coextruded rods 0.590" by 11" long. The cluster was irradiated in the ETR where one rod was deliberately failed at power and continued to operate for an additional 7 hours. (HW-64747) RM-557

February 1960 – 327 Radiometallurgy Laboratory performed post irradiation examination on a seven rod, 1.6% enriched U cluster fuel element made up of 0.030" wall Zr-2 clad and coextruded rods 0.590" by 11" long. The cluster was first irradiated in the KER facility to 2390 MWD/T then shipped to the ETR where one rod was deliberately failed at power after accumulating 2450 MWD/T total exposure. Element discharged 1/26/60 and shipped to 327 2/5/60. Sectioned to remove a wafer from defect site and then sectioned again for comparison purposes. (RM 558) (HW-64032)

March 1960 – A procedure was established for disposal of waste cartons containing dry radioactive waste from the 308 Building. It recommended high level Pu waste from 308 be disposed at the 200 West Burial Ground. Accordingly, arrangements were made with Fuels preparation Dept. to obtain a load lugger for storage and transfer of waste to 200 West on a routine basis. (HW-64591)

March, 1960 – Cask received in 327 from Battelle Memorial Institute containing about 1,000 Ci of Pu and U samples; unloaded in D cell. (HW-64591)

March 4, 1960 - Report issued describing the results of 327 Radiometallurgy Laboratory burst tests on two irradiated, Zr-2 pressure tubes from KE. The purpose of the examination was to determine the effects of the reactor environment on strength and ductility of the pressure tube. (HW-64168)

April 1960 – 327 Radiometallurgy Laboratory performed post irradiation examination on a failed seven rod, 1.6% enriched U cluster fuel element made up of 0.020" wall Zr-2 clad and coextruded rods irradiated to 2200 MWD/T in KER. The cluster was designed for 4,000 MWD/T exposure but discharged on 2/3/60 at 2520 MWD/T due to a failed rod (HW-64691, HW-70423)

April 1960 – 2 self-supported, 1.47% enriched elements irradiated under PT-IP-247-A for about 800 MWD/T received for exam. (RM 404) (HW-64898)

April 4, 1960 – Antimony-beryllium source was disposed of. (RSR-1576)

May 1960 – As a result of an error in loading a gatling gun cask (at 327 Radiometallurgy Laboratory) with low level, cut up process tubes for transport to 300 North, an extremely high dose rate to the hands of an employee occurred. Contamination to 60,000c/m was detected on a truck used to transport the milk pail cask to 300 North. Waste removed from 325 showing dose rate of 7.5 R/hr. at surface, including 1.5 R/hr. at 2". Pu-238 transferred into casks for shipment in 325. (HW-65441)

May 1960 – Zirflex de-cladding process developed in 325 Radiochemistry Laboratory and demonstrated in 321 Facility. (HW-65332)

May 1960 - 327 Radiometallurgy Laboratory performed post irradiation examination on a Zr-4 clad, 3.2% U^{235} enriched uranium dioxide fuel element that was purposely defected by drilling a 0.005" hole in the cladding. The element was irradiated in the MTR for 70 minutes. It was examined to determine the irradiation stability of Zr-4 cladding in a defected element and to compare the effects on the fuel with those from two similar defected fuel element irradiations. (HW-66461)

May 23, 1960 – A cement barrel containing low level waste in glass jugs had a small hole through the 1" of cement covering the waste. (It is not known if cement was solidified.) Barrel was re-capped and sent to burial ground. (RSR-2070)

June 1960 – Trench 7 opens (based on educated guess)

June 1960 – The following depleted scrap was disposed to 300 north:
168 drums and 4 boxes from University of California,
!0 drums from Metallurgical Corp, Albany, Oregon,
58 drums from Dow Chemical Co., Denver Colorado. (HW-65994)

June 1960 – RM 568, exam of 36" tube-in-tube, co-extruded element that ruptured in KER on April 24, 1960 after 1200 MWD/T exposure (HW-65854).

June 6, 1960 – Contaminated Zr turnings (1 R at 12") from 325 Lab., enclosed in metal cans, was disposed to 300 North Burial Ground. (RSR-2193)

June 8, 1960 – Pu contaminated glovebox disposed of. (RSR-2220) Loading of waste barrels in 325 involved dose rates to 4 R/hr at surface and 400 mR/hr. at 2". Unmarked waste carton, giving 3.1 R/hr at 3", detected near E cell in 327 and subsequently removed to load lugger. (HW-65946)

July 1960 – Duct work and several cyclone separators were removed from the 306 Building and buried at 300 North as low level waste. (HW-66280) The following depleted U scrap was placed in the 300 North Burial Ground: 168 drums and 4 boxes from University of California, Berkeley; 10 drums from Metallurgical Corp., Albany, Oregon and 58 drums from DOW Chemical, Denver, Colorado. (HW-65994)

July 1960 - 327 Radiometallurgy Laboratory performed post irradiation examination on the last fuel element in a series of four that were deliberately defected while being irradiated at power in the ETR Reactor. The fuel element was fabricated with natural U and coextruded Zr-2 clad. It was charged and discharged from the ETR the same day. (HW-66814)

July 1960 – Work on project CGH-790, "High Level Radioactive Material Receiving and Storage Addition – 327 Building" complete. Allowed for the canyon of the 327 Building to be enlarged to enable handling, decontamination, and storage of irradiated materials of larger physical size and higher radiation levels. (HW-66237)

July 1960 – Report issued summarizing the results of a 327 Radiometallurgy Laboratory post irradiation examination on irradiated Zr-2 process tubing samples (approx 12 samples) to determine changes in properties caused by operating conditions and irradiation. (HW-65999)

July 1960 – Irradiated cluster-type element received at 327 for sectioning; discharged 5/14/60 from KER Loop 3; exposure of about 2150 MWD/T (HW-68088)

July 1960 – Exam of irradiated 36" (PT 250-A, Supp. C) element at 327 continuing during month; sectioning completed; discharged 4/24/60; exposure of about 2150 MWD/T in KER Loop 4 (HW-66237)

July 6, 1960 – Two ice cream containers of Pu liquid from 329 Biophysics Laboratory sent to 618-10 (RSR-601277)

July 11, 1960 – Ductwork and cyclone separators removed from 306 Building and disposed to 618-10. (RSR-600047)

July 19, 1960 – Final report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of four self supporting fuel elements and two rib supported fuel elements, all both 1.47% enriched U, irradiated in B Reactor (RM-404). Exposures of rib supported fuel elements were 353 and 359 MWD/T. Exposures for self supporting fuel elements were 845 and 959 MWD/T. (The self supporting fuel elements have ribs fastened to the outside of the fuel element to center the fuel element in a ribless process tube while the rib supported fuel elements are centered in the process tube by ribs fixed to the inside of the process tube). Transverse and longitudinal sections made on two of the self-supporting elements; U cores of all six element examined. (HW-66106, HW-59756)

July 28, 1960 – A Pu drum was disposed of. (RSR-2688)

August, 1960 – Work on project CGH-860, "Access for PRTR Fuel Elements" complete. Allowed for modifications to 327 Building High-Level Examination and Cut-off Cell (A Cell) to be enlarged to accommodate sectioning PRTR fuel elements. (HW-66644)

August 1960 – High dose rates (1R/hr.@ 2") were encountered during removal of a contaminated load lugger from the vicinity of 327 to 300 North. (HW-66670)

August 1960 – Sample of undissolved residue from the REDOX multipurpose dissolver sectioned and a sample dissolved and sent to analytical lab for analysis (HW-66644-DEL).

September 1960 – Report issued detailing results of post irradiation examination (at 327 Radiometallurgy Laboratory) of a seven rod cluster fuel element with newly designed, hot headed end closures. The cluster was irradiated to 2010 MWD/T in KER. Two rods sectioned to remove two wafers from each rod; one rod sectioned longitudinally at end closure and about ¼" U. (HW-66721) Discharged 5/14/60 (HW-70423)

September 1960 – Exam of enriched KER tube-tube element that failed in July 1960 at 3200 MWD/T (RM 569). Exam of 12" Nat. U element instrumented with thermocouples, discharged 7/7/60 and irradiated to 1030 MWD/T complete (RM 570). Exam of 2nd 12" Nat. U element instrumented with thermocouples, discharged (failed) 8/21/60 and irradiated to 250 MWD/T in progress (RM 571) (HW-66960-DEL).

October 1960 – Second phase of the Metal Fabrication Development Building, 306-E, construction completed. (HW-76254)

October 1960 – PRTR startup. (HNF-EP-0649) Based on a review of Radioactive Survey Records (RSRs) it is estimated that the 309 Facility contributed an estimated 2% of the total waste volume to 618-10 Burial Ground.

October 1960 – Twelve fruit cans and 32 milk pails of irradiated fuel slugs from 327, and 234 cardboard cartons of lab waste sent to burial ground. (Summary sheet for land burial dated October, 1960, WHC-MR-0415)

October 1960 – 327 Radiometallurgy Laboratory performed post irradiation examination of a failed, enriched fuel element clad in X8001 aluminum alloy that was charged into 4585-KW in September 1960. (HW-68276) Discharged 10/13/60 at 134 MWD/T (HW-67286)

October 1960 – 327 Radiometallurgy Laboratory performed post irradiation examination of a failed, enriched fuel element clad in C64 aluminum alloy. The fuel element was irradiated in tube 1656 C and achieved 107% of goal exposure. (HW-68485) RM 421. Exam started Nov. 1960; intense radioactivity made further exam in 10" cell impossible until further decay (HW-67352)

October 15, 1960 –Project Proposal CGH-877, "321 A Pyrochemical Test Facility" completed. The project provided approximately 900 square feet in the 325 A Building to be used for development work on non-aqueous processes for processing spent reactor fuel and related activities. (HW-61905, HW-66960)

November 1960 – The filter for C-Cell in the 325-A Facility was removed and taken to the burial grounds. (HW-67642)

November 1960 – forty-seven steel cans of metallurgical samples from 327, ten 55 gallon drums from 325 and 126 cardboard cartons of lab waste sent to burial grounds. (Summary sheet for land burial dated November, 1960, WHC-MR-0415)

November 2, 1960 – Report was issued summarizing 327 Radiometallurgy Laboratory results of post irradiation examination of a failed, coextruded Zr-2 clad fuel element from KER loop 4 after an exposure of 1100 MWD/T (RM 568). Clad thickness 0.030". The 1.6% enriched U was alloyed with 2% Zr. Discharged 4/26/60; inner tube sectioned. (HW-67288)

December 1960 – Ion exchange recovery and purification of kilocurie quantities of Sr-90 was initiated in 325-A with 150 gallons of Sr enriched crude solution shipped from PUREX. (HW-67954)

December 1960 – Six steel cans and 22 milk pails of metallurgical samples from 327, eight 55 gallon drums from 325 and 262 cardboard cartons of lab waste sent to burial grounds. (Summary sheet for land burial dated December, 1960, WHC-MR-0415)

December 1960 - 327 Radiometallurgy Laboratory performed post irradiation examination of two Ni plated, production fuel elements irradiated in C Reactor to 800 MWD/T. These elements were selected for examination because one had incurred a hot spot during irradiation and the other contained some unusual cracks in the Ni plate. The program also included examination of 2 un-irradiated elements for comparison with the irradiated fuel elements. RM 414 Transferred to 327 in 12/60 after about 6 weeks in the 105C basin. (HW-69285)

December 1960 – A 1" diameter by 4" long fuel element containing enriched U pellets in Mg matrix exposed to about 15,000 MWD/T in MTR visually examined and measured (RM 575) (HW-67954)

December 16, 1960 – Flux monitors from 325 Lab. reading up to 5 R/hr. at 2" were discarded. (RSR- 432?)

December 19, 1960 – Glass vial from 325 Lab. containing uranium sulfate was discarded. (RSR- 4335)

December 21, 1960 – Three Pu contaminated gloveboxes were disposed. (RSR-4408)

1961 – 327 Building supported Pu impregnated graphite and GEH prototypic fuel pin programs. (HNF-EP-0649)

January 1961 – The waste disposal and decontamination service for Hanford Laboratory Operation became the responsibility of Facilities Engineering Operation this month. Includes disposal of hot liquids and dry waste and involves operation of 340 Bldg, 300 N Burial Ground and the 325 concreting facility. (HW-68350)

January 1961 – Thirty-two milk pails and twelve steel cans of metallurgical samples from 327, twenty 55 gallon drums from 325 and 288 cartons of lab waste were sent to burial ground. (Summary sheet for land burial dated January, 1961, WHC-MR-0415)

January 1961 - 327 Radiometallurgy Laboratory performed post irradiation examination on a natural uranium fuel element clad in X-8001 aluminum alloy. This element was selected for detailed examination out of several elements because it exhibited excessive (0.069") of diametric elipticity. The fuel element was irradiated in tube 3582-D to an exposure of 1246 MWD/T. RM 416 Discharged 11/12/60; transferred in 01/61; sectioned; two wafers removed and a longitudinal section; additional sections made to determine extent of spire-U gap. (HW-68707)

January 1961 – Construction completed on Project CGH-819, "Increased Lab Waste Facilities 300 Area". This project increased the contaminated liquid waste handling facility and involved greater storage capacity and improved load-out accommodations. (HW-68350)

January 1961 – Examination of two elements from PT 292-A, discharged on 7/3/60 at 3150 MWD/T, in progress (HW-68350). Exam for all four elements included in 292-A was scheduled to begin 7/20/60 (HW-66237). Radiomet of failed element, including sectioning, occurring 09/1960 (HW-66960-DEL). Exam of I&E hole failure (1656-C, RM 412) and I&E hole failure (4584-KW, RM 415) in progress (HW-68350).

January 1961 –Exam of I&E hole failure (1656-C, RM 412) and I&E hole failure (4584-KW, RM 415) in progress (HW-68350).

January 5, 1961 – Report issued summarizing ruptured fuel element examinations in the Radiometallurgy Lab 1959 – 1960 (HW-68046)

January 10, 1961 – Resin from 325 lab. (presumably ion exchange resin) reading up to 600 mR/hr. was transferred to waste cask for disposal. (RSR-4648)

January 16, 1961 – Piglets, slurp jug and Hg jug from 325 Lab prepared for cemented barrel disposal. 5 R/hr. (RSR-4775, RSR- 4776)

January 27, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of two tubular elements that had been closed by brazing with a Zircaloy-5 weight % Be alloy followed by fusion welding. The elements were irradiated in the KE Loop 2 for 70 hours when a failure shut down the reactor. Examination by the lab concluded that the failure was not attributed to these elements but rather to other experimental elements being irradiated in the same loop. (HW-68089) Discharged 8/8/60 (HW-70423). Examined 09/60 (HW-66960-DEL)

February 1961 – Thirty-nine milk pails and 20 steel cans of irradiated fuel element samples from 327, twelve 55 gallon drums of liquid waste from 325, one contaminated crane from 327 and one Pu contaminated glovebox from 325 and 576 cartons of lab waste were sent to burial ground. (Summary sheet for land burial dated February, 1961, WHC-MR-0415)

February 15, 1961 - Pu waste removed from glovebox in room 47A of 325 Lab. and placed in cardboard box, sealed in plastic. (RSR- 5274)

March 1961 – Twenty-nine miscellaneous irradiated metal and fuel element samples from 327, sixteen 50 gallon concrete sealed steel drums from 325 and 774 cartons of lab waste were sent to burial grounds. (Summary sheet for land burial dated March, 1961, WHC-MR-0415)

March 1961 - 327 Radiometallurgy Laboratory performed post irradiation examination on a failed I&E, enriched uranium fuel element clad in X-8001 aluminum alloy irradiated in H Reactor. Cause of the failure was water penetration of the clad due to accelerated corrosion adjacent to a hot zone. (HW-68834)) Shipped to 327 on 3/2/61. RM 411 Sectioned transversely thru water entry site (HW-68834). Failed 2/12/61 at 825 MWD/T (HW-68718)

March 1961 – Exam of RM 417, RM 420 and RM 422 in progress (HW-69062)

March 3, 1961 – Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of a fuel element failure that occurred in tube 1471-KE. The natural U element was clad in X8001 Al alloy and failed near goal exposure. (HW-68744) Failed 11/27/60 at 667 MWD/T (HW-67681) RM 417 Sectioned thru the rupture at the female end during 01/61 (HW-68350)

March 9, 1961 – Chain hook, choker cables and gloves from 305B sent to burial trenches. (RSR# 600333)

April 1961 – Report issued for PT-IP-292A; four 18" elements irradiated to 3150 MWD/T in KER 2; discharged 7/3/60; metallography, density, burn-up analysis (HW-69437); exam in progress 01/61 (HW-68350) Refer to January 1961 entry.

April 1961 – Forty-six milk pails of metallurgical samples from 327, sixteen 50 gallon concrete sealed drums of liquid waste from 325 and 522 cartons of lab waste were sent to burial ground. (Summary sheet for land burial dated April, 1961, WHC-MR-0415)

April 1961 – Project CGH-805, "High Temperature Tensile Testing Cell – 327 Building", complete. Project provided equipment for performing room and high temperature tensile tests on highly irradiated materials and involved installation of new cell in 327 Radiometallurgy Laboratory. (HW-69062)

April 3, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of three natural U, X-8001 Al alloy clad, I&E production fuel elements irradiated to 1094 MWD/T in 3363-D. The exam was conducted to determine cause of a 15 g weight loss and whether corrosion was uniform or localized. RM 418 in progress 02/61. Three 3 wafers removed from two elements and two wafers from 3rd; discharged 10/19/60 (HW-68712) (HW-69064)

April 6, 1961 – Work in A Cell with PUREX Sr.90. Removed two 55 gallon drums of solid waste. Each 55 gallon drum will only contain 3 one gallon cans. Most of the cans will contain crush glass, rags, paper, metal, and plastic. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

April 7, 1961 – Two 1" lead lined 55 gallon drums from 325A, A-cell and B-cell. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

April 11, 1961 – Three waste boxes with plastic, rags, paper, tubing, one box reading 1 R/hr. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

April 12, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of a failed natural U, X-8001 Al alloy clad, I&E production fuel element irradiated to 640 MWD/T in 3781 H. (HW-69235)) RM 420 Discharged 1/19/61 at 648 MWD/T (HW-68343)

April 20, 1961 – Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of a fuel element failure that occurred in tube 3476-KE. The natural U element was clad in X8001 Al alloy and failed near goal exposure. 2nd of two hole failures to be examined under RM 417 (HW-69325). Discharged 12/10/60 at 495 MWD/T (HW-68039)

May 1961 – PRTR achieves full 70MW power reactor fuel tests begin. (HNF-EP-0649)

May 1961 – Receipt of the first PRTR (UO_2) irradiated fuel element at 327 was expected in the latter part of May or early June. (HW-69817)

May 1961 – Eighty-eight milk pails of metallurgical samples from 327, twenty-four 50 gallon concrete sealed drums of liquid waste from 325, four cardboard cartons of CWS filters from 327, forty stainless steel cans of irradiated fuel samples from 327 and 486 cartons of lab waste were sent to burial ground. (Summary sheet for land burial dated May, 1961, WHC-MR-0415)

May 1961 – RM 421, RM 423 and RM 425 in progress.

May 3, 1961 – Physical Completion date for Project CAH-870, "Facility for Recovery of Radioactive Materials – 325 Bldg." The project provided for an addition to the 325 Building to enable recovery of specific radioisotopes (cerium) from wastes. (HW-69822, HW-63671)

May 23, 1961 – New trench placed in service. (RSR-??585) Two rusty casks from 325 disposed of. (RSR-6481)

May 31, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination on two natural U, I&E, bumper fuel elements, clad in X-8001 aluminum alloy and irradiated in D Reactor. The examination characterized the severe corrosion and determined the irradiation induced dimensional changes. "Bumper" refers to a type of fuel element that employs the use of projections on the outside diameter to maintain proper alignment of the fuel element in the process tube to minimize hot spot type failures. Both elements discharged 1/26/61; exposure of 990 and 962 MWD/T. RM 423 (HW-69791, PT-IP-262-A) Three wafers removed from each element 05/61 (HW-69822)

June 1961 – Twenty-five milk pails and 18 stainless steel cans of metallurgical samples from 327, one cardboard carton of CWS filters from 327, sixteen 50 gallon concrete sealed drums of liquid waste from 325 and 414 cartons of lab waste were sent to burial ground. (Summary sheet for land burial dated June, 1961, WHC-MR-0415)

June 1961 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of two ruptured "bumper" fuel elements irradiated in tubes 2676-D (failed 1/21/61 at 957 MWD/T (HW-68343) and 2878-D (failed 1/26/61 at 966 MWD/T (HW-68343) . Both were clad in X8001 alloy. Fuel enrichment was 0.947 U^{235}. The design exposure was 1200 MWD/T but it is unknown if these fuel elements achieved this goal. "Bumper" refers to a type of fuel element that employs the use of projections on the outside diameter to maintain proper alignment of the fuel element in the process tube to minimize hot spot type failures. RM 421 (HW-69965, Process Test IP-262-A). Exam in progress 05/61 (HW-69822)

June 2, 1961 – 4 waste boxes from A-cell, manipulator boots, poly tubing, 1 gallon cans of waste, 1 reading 500 mR/hr., and 1 reading 1 R/hr. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

June 20, 1961 – Fission gas "boats" from 327 were disposed. (RSR-272095) Waste from A and B cells into one 1" (leaded?) 55 gallon drum and one 2" (leaded?) 55 gallon drum. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

June 21, 1961 – Drum of Th and Sr waste from 321 Building sent to 618-10 (RSR-600958)

July 1961 – A fire in the 300 North Burial Ground resulted in the destruction of flammable material in one of the trenches and spread contamination outside the fenced area. Approximately 200 waste boxes and several contaminated CWS filters were destroyed. It was recommended that these trenches be covered with dirt at least weekly. (HW-70584)

July 1961 – Nineteen stainless steel cans of metallurgical samples from 327, thirty-eight milk pails of irradiated fuel element samples, sixteen 50 gallon concrete sealed drums of liquid waste from 325, one glovebox from 325, one wooden box of steel cell trays from 327 and 440 cartons of lab waste were sent to burial ground. (Summary sheet for land burial dated July, 1961, WHC-MR-0415)

July 18, 1961 – Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of two failed, natural U fuel elements, on from tube 1985-F (529 MWD/T (HW-64122), clad in alloy C64, and one from tube 2471-F (466 MWD/T (HW-65924), clad in X8001 alloy. Discharged 2/25/60 and 6/3/60, respectively. Exam results previously reported in letters issued 9/13/60 and 10/5/60, respectively. (HW-70369) Results for 1985-F discussed in 08/60 monthly report (HW-66644-DEL). Results for both discussed in 09/60 monthly report (HW-66960)

August 4, 1961 – A contaminated hood, damper and duct from 326 Building were disposed at 300 North Burial Ground. (RSR-601023)

August 21, 1961 – Acid etched waste containing scrap U from 306 Building sent to 618-10. (RSR-601328)

August 28, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of three self-supporting , natural U, I&E production fuel elements which exhibited serious in-reactor corrosion. These elements were irradiated in C-Reactor to 686 MWD/T (two elements) and 1051 MWD/T. (HW-70744) All discharged on 4/17/61 (RM 425) Visual exam and as-received photography completed 05/61 (HW-69822)

August 28, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of a dingot fuel element irradiated to an exposure

of 300 MWD/T in 2689-DR. The element was damaged to the extent that it was impossible to determine the cause of failure. Uranium produced by the dingot process has fewer impurities and was expected to produce metal with fewer inclusions and stringers, and at lower costs than the ingot process. The drawbacks were the high H content characteristic of dingot material caused brazing problems and irradiation program lacked pile experience at high exposures. Discharged 6/9/61 Several sections, both transverse and longitudinal, were made to determine extent of the reaction and one transverse and one longitudinal section were selected for metallography. (HW-70858, HW-46407)

September 5, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of two overbore, dingot fuel elements irradiated in C Reactor to 402 and 168 MWD/T. These elements were characterized to determine the irradiation behavior of overbore fuel elements. The overbore concept involved enlarging some graphite channels (in C Reactor) by up to 550 mils to accommodate larger fuel elements which would allow for increased Pu production by 15 to 18%. Uranium produced by the dingot process has fewer impurities and was expected to produce metal with fewer inclusions and stringers, and at lower costs than the ingot process. The drawbacks were the high H content characteristic of dingot material caused brazing problems and irradiation program lacked pile experience at high exposures. Discharged 4/30/61 (402) and 2/25/61 (168); one wafer from higher exposure element and two from lower. (HW-70941, HW-46407, HW-67720-A)

September 11, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of an enriched I&E fuel element discharged from DR Reactor because of a break in the X-8001 clad. Discharged 5/17/61from 2657-DR (HW-71011). B-cell waste two 2" lead 55 gallon and three 1" 55 gallon drums. Glass filters, sample vials, rags and metal. 1WW wash. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

September 12, 1961 – Vacuum cleaner containing Zr powder exploded in 325 Radiochemistry Laboratory. (RSR-7821)

September 15, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of an enriched I&E fuel element discharged from H Reactor because of a break in the X-8001 clad. Discharged 6/18/61 (HW-71063)

October 1961 – The high level waste handling and decontamination work in 325 has been studied and plans are underway to renovate work area and procedures for increased safety and efficiency. (HW-71535)

October 6, 1961 – Four culvert 55 gallon drums from A-cell. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

October 9, 1961 – 9 CWS filters were removed from cell exhaust. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

October 13, 1961 – Glovebox (HEW 437665) from 325A Lab. disposed to 618-10. Glovebox was placed in plastic, then in plywood box with radiation labels attached to box. (RSR-8216)

October 17, 1961 – Bricks (unknown material) from 306 Building disposed to 618-10. (RSR-601487, RSR-600271)

October 26, 1961 – Sr glove hood (referred to as glovebox in other RSRs) from 325A Lab. disposed to 618-10. (RSR-8311, RSR-8377). One small glove box in wood box, photo. 061541-1. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 1961 – Trench 9 opens. (based on educated guess)

November 1, 1961 – A-cell waste, 2 culvert 55 gallon and one 1"lead drum (Sr-90) (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 11, 1961 – B-cell waste, two 1" lead and three 2" lead 55 gallon drums. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 22, 1961 – Lucite hood (HEW 445875) from 325 Lab. surveyed prior to disposal. (RSR-8714)

November 28, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of one overbore, I&E fuel element, clad in X-8110 alloy irradiated in C Reactor. The overbore concept involved enlarging some graphite channels (in C Reactor) by up to 550 mils to accommodate larger fuel elements which would allow for increased Pu production by 15 to 18%. Wafer sectioned. (HW-71792)

November 28, 1961 – C-cell waste, two 1" lead inserts 55 gallon drums. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

December 1961 – 14 samples dissolved for burn-up analysis; RM 587, RM 592, RM 589, GEH-12-8 in progress

December 5, 1961 – A drum of thorium contaminated lathe coolant from 306 Building was disposed to 618-10. (RSR-600304)

December 18, 1961 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of one failed, enriched I&E fuel element, clad in X-8110 alloy irradiated in H Reactor. Element discharged 9/6/61. (HW-72057) Examination in progress 11/61 (RM 434) (HW-71921)

December 20, 1961 – A-cell waste one 55gallon drum reading 2 R/hr. through side.

December 22, 1961 – A-cell waste one 55 gallon drum: Tc, Pm, Sr, and Am. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

December 26, 1961 - Brick pile (material unknown), ductwork from 325 Lab. surveyed prior to disposal. (RSR-9085)

1962 – 327 Bldg performed PRTR pressure tube burst testing and examination of prototypic fuel materials such as magnesium oxide and PuO_2. (HNF-EP-0649)

1962 to 1964 – 325 Lab performed waste solidification tests using a phosphate glass melter. (WHC-MR-0388)

January 1962 – Waste Handling procedure issued which states the following:
Low level waste includes any potentially contaminated material the 327 canyon, generally originating outside the cells. Such wastes are collected in cardboard cartons 18" square x 21" high. When swabs containing cleaning liquids from equipment decontamination are to be discarded in these cartons, a heavy polyethylene bag is used as a liner and sealed separately. Burial is in an open pit in a controlled burial ground. Additions to the pit are covered weekly. The normal output for 327 is about 50 cartons per week. Radiation levels generally vary from 5 to 200 mR/hr. @ 1' from a sealed carton, although much higher readings are occasionally experienced.

Intermediate level wastes occur in large quantities in 5 of the 327 Building cells, and are disposed of in expendable waste cans known as "milk pails". Milk pails are 7" in diameter and 10" high of spun aluminum, 0.025" thick and fitted with a rigid bail. They are inserted into a plastic bag (held in place by a rubber band) before being placed in a cell to minimize contamination to the milk pail exterior. The 7" diameter allows the milk pail to be inserted through a standard roof port, and large enough to accept about 20 grinding and polishing discs stacked horizontally.

Milk pails of waste are sealed by filling them with warm 20% solution which effectively traps dust and particulate matter. The gelatin is allowed to set over night and will hold massive pieces of metal firmly, except when submitted to violent agitation.

Milk pails of waste are removed through the cell roof directly into an inverted bucket-type cask with a slide on the bottom. The plastic bag is removed in the cell. Two milk pail casks are used for removing intermediate level wastes. All in-cell wastes solid wastes, except those too radioactive to be shielded by the 4" of lead of a milk pail cask, are handled in this manner. In addition, all highly radioactive liquids such as dissolve solution are sealed in plastic or stainless steel containers and disposed of in milk pails. Burial is accomplished by allowing the milk pail to fall from the cask through a chute in the floor of the carrier truck into a vertical burial pipe.

Radiation levels for loaded milk pail casks are generally about the same as those for waste cartons with occasionally higher readings. About 36 milk pails are used each month.

High level wastes include irradiated material upon which examination has been completed, and which will not be returned to the Pu production process, and also filters from the cut-off saw submersion tank drain line. These wastes are canned in commercial one quart juice cans which are disposed of in a special cask known as a "gatling gun cask". The cask provides 7" of lead shielding and handles 12 cans in a rotating 6 barrel chamber. Burial is accomplished by allowing the cans to fall through a chute of a flat bed trailer into the vertical pipe. The trailer bed provides 1" of lead shielding for the operators. About 30 cans are disposed each month. (HW-72103) (This HW also states that 200,000 gal per month of low level liquid wastes were produced by the entire Hanford Laboratories Operation and trucked to the (200 Area) Hanford Site. During the last 15 months (from the time this report was written) those wastes averaged 400 microcuries per gal beta and 2E-06 gm Pu per gal. About 1/2 of this volume was estimated to originate from 327.)

January 9, 1962 – B-cell waste three 1" lead 55 gallon drums. (Solid waste removed from 325A per Appendix A, HNF-EP-0649) (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

January 12, 1962 – B-cell CWS filter. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

January 16, 1962 – Pu contaminated ductwork, Pu and beta contaminated vacuum cleaner (HEW 453520), and bolt cutters from 325 Lab. disposed at 618-10. (RSR-009360, RSR-009363)

January 21, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of one overbore, fuel element irradiated in C Reactor to 907 MWD/T. The overbore concept involved enlarging some graphite channels (in C Reactor) by up to 550 mils to accommodate larger fuel elements which would allow for increased Pu production by 15 to 18%. Wafer sectioned. (HW-72510)

January 24, 1962 – 1 culvert 55 gallon drum from C-cell. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

January 25, 1962 – The following Pu contaminated items from 325 Lab. were boxed for disposal: "Mini" mixer settler (HEW-445870), "Mini" displacement apparatus (HEW-401575), "Mini" Roller Smith Balance. (HEW 417715). (RSR-8445)

February 7, 1962 Load lugger containing graphite boats from 3730 disposed to 618-10. (RSR-600032) (The 3730 Building replaced the 3741 Building and quickly became contaminated as a result of handling/storing/processing of irradiated graphite, flux wires and fuel samples).

February 9, 1962 – "Hot Pig and lead bricks from 340 Building disposed at 618-10 VPUs. (RSR-8775)

February 20, 1962 – A-cell waste 3culvert 55 gallon drums (sample vials, glass, rags). (Solid waste removed from 325A per Appendix A, HNF-EP-0649) Reference made to new burial pit (RSR-601773)

February 21, 1962 – A-cell waste SST tubing, fittings, valves. One 55 gallon drum. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

February 23, 1962 – A-cell waste one 1" lead drum and 2 culvert drums. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

February 26, 1962 – Contaminated paint containers and one drum of "brass activator" from 327 were disposed. (RSR-?5??). A-cell waste one 1"lead drum and 1 culvert drum. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

March 1, 1962 – A-cell waste one 15 gallon black iron can. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

March 9, 1962 – October 2, 1962 – Wye Burial Ground (618-11) operational. (Closed temporarily for 11 months beginning October 3, 1962 so additional burial facilities could be added.) (HNF-EP-0649)

March 12, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of one overbore, I&E fuel element irradiated in C Reactor to 958 MWD/T. The overbore concept involved enlarging some graphite channels (in C Reactor) by up to 550 mils to accommodate larger fuel elements which would allow for increased Pu production by 15 to 18%. Wafer sectioned. (HW-72989)

March 14, 1962 – B-cell CWS filter Sr-90. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

March 19, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of two overbore elements which exhibited severe cladding corrosion after irradiation in C Reactor to 906 and 951 MWD/T exposure. The overbore concept involved enlarging some graphite channels (in C Reactor) by up to 550 mils to accommodate larger fuel elements which would allow for increased Pu production by 15 to 18%. Both elements discharged 10/12/61. Two wafers sectioned from higher exposure element and one from lower. (HW-73062)

March 19, 1962 - Report issued describing the metallographic techniques used in the examination of irradiated $U0_2$ and Pu-Al alloys in the 327 Radiometallurgy Laboratory. (HW-SA-2499)

March 21, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of the highest specific power, overbore, fuel element irradiated in C Reactor to 958 MWD/T. The overbore concept involved

enlarging some graphite channels (in C Reactor) by up to 550 mils to accommodate larger fuel elements which would allow for increased Pu production by 15 to 18%. Wafer sectioned from center of element. RM-440 (HW-73109)

March 22, 1962 – A-cell one 55 gallon drum containing SST items and lead brick. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

March 23, 1962 – A-cell TK-7 and one 55 gallon drum with SST items. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

March 28, 1962 – A-cell shipped 3 boxes containing glass pipes 4" x 9' long and two 55 gallon drums of small metal parts, valves and tubing. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

March 29 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation (sectioned) examination of two failed, enriched, I&E, bumpered, fuel element irradiated in H Reactor to 605 and 1050 MWD/T. "Bumper" refers to a type of fuel element that employs the use of projections on the outside diameter to maintain proper alignment of the fuel element in the process tube to minimize hot spot type failures. (HW-73181) Rupture dates of 12/13/61 and 12/23/61 (HW-72179)

March 29, 1962 – 3 boxes containing glass pipes. 6"OD x 9' long and one 4' x 4' x 8' box metal rakes, tanks, tubing, and two 55 gallon drums of junk. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

April 1962 through September 1962 – 300 North Burial Ground trenches closed (temporarily). VPUs remained operational during the time of modification to the Wye Burial Ground. (HW-75459, D&D 23840)

April 1962 – Criticality accident closes RECUPLEX operation. (200-W Area) (WHC-MR-0293)

April 2, 1962 – Two 4' x 4' x 8' wood boxes of metal equipment, two 30 gallon drums with lead and three 5 gallon buckets with lead. (Solid waste removed from 325A per Appendix A, HNF-EP-0649, temporary closure of 618-10 trenches suggests this waste went to 618-11 trenches)

April 4, 1962 – 11 wood boxes 8" x 20" x 28" with lead bricks. (Solid waste removed from 325A per Appendix A, HNF-EP-0649, temporary closure of 618-10 trenches suggests this waste went to 618-11 trenches)

April 6, 1962 – Three 20 gallon tanks and 6 boxes of lead. (Solid waste removed from 325A per Appendix A, HNF-EP-0649, temporary closure of 618-10 trenches suggests this waste went to 618-11 trenches)

April 19, 1962 – Contaminated lumber from 325 Bldg disposed in 618-10. (RSR-10331)

May 8, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of two failed enriched fuel elements suspected to have weld closure failures (but didn't). Both were irradiated in H Reactor to exposures of 880 (2669-H) and 829 (3174-H) MWD/T. (HW-73587) RM 444; 2669-H failed 1/21/62 and 3174-H failed 1/25/62 (HW-72567) Exam occurring 04/62 (HW-73514)

May 10, 1962 – A cask was used to deliver Zr-2 scrap from 326 Building to 618-10. (RSR-600136)

May 10, 1962 - Eight boxes of lead bricks and one 55 gallon drum 1 wood box of junk 30" x 30" x 35'. (Solid waste removed from 325A per Appendix A, HNF-EP-0649, temporary closure of 618-10 trenches suggests this waste went to 618-11 trenches)

May 15, 1962 – Work on project CGH-858, "High Level Utility Cell, 327 Building" complete. Allowed for increasing capacity of radiometallurgical tests by adding a new cell with remotely operated lathe, milling machine, NaK processing equipment and other miscellaneous equipment. (HW-73905) [Note: Machining operations on irradiated materials in the cell were not initiated until November (HW-75625).]

May 21, 1962 – 3 culvert drums of waste from B-cell, glass, rags, plastic. The work was with 1WW feed from PUREX process. (Solid waste removed from 325A per Appendix A, HNF-EP-0649, temporary closure of 618-10 trenches suggests this waste went to 618-11 trenches)

May 22, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of three irradiated, Zr-2 pressure tube from PRTR. The purpose of the examination was to determine the effects of the reactor environment on strength and ductility of the pressure tube. (HW-73698)

May 22, 1962 – Zr-2 and stainless steel scrap from 326 Building disposed to 618-10. (RSR-600130)

June 6, 1962 – Report issued summarizing 327 Radiometallurgy Laboratory post irradiation examination on one overbore element discharged from 4463C on 1/16/62 with corrosion to the X-8001 clad after an exposure of 631 MWD/T. The overbore concept involved enlarging some graphite channels (in C Reactor) by up to 550 mils to accommodate larger fuel elements which would allow for increased Pu production by 15 to 18%. RM 443 Sectioned to remove two wafers for met examination. (HW-73934)

June 13, 1962 – A cask was used to deliver Zr-2 and stainless steel scrap from 326 Building to 618-10. (RSR-600162)

June 15, 1962 – Two contaminated gloveboxes, ducting and a stainless steel sink (Pu contaminated) from 325 Radiochemistry Laboratory sent to 618-10. (RSR-10783)

June 26, 1962 – 1382 gallons of D12 EDPA to 300-N Cribs. (RSR 100108) The 300-N Cribs, designated as 316-4, were used for disposal of 321 Bldg organic wastes. Also, HW-75127, page 118 of 195, (and multiple other documents) indicates that "D12 EDPA" should be "D2EHPA", which is di-2-ethylhexyl phosphoric acid.

July 2, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of one of 3 elements suspected of weld closure failure. The element was discharged 1/23/62 from 4667 KE at 254 MWD/T. RM 444; Wafers sectioned. (HW-74160) Exam complete by 06/62 (HW-74153)

July 12, 1962 – A cask was used to deliver Zr-2 scrap and stainless steel waste from 326 Building to 618-10. (RSR-600178)

July 24, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of one failed, enriched, I&E, bumpered, fuel element irradiated in F Reactor The failure occurred after 24 hours exposure in the reactor. "Bumper" refers to a type of fuel element that employs the use of projections on the outside diameter to maintain proper alignment of the fuel element in the process tube to minimize hot spot type failures. RM C-401 (HW-74474)

July 27, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of three failed, I&E, bumpered, fuel element irradiated in D Reactor The failures occurred at low exposures of 77, 79, and 118 MWD/T. "Bumper" refers to a type of fuel element that employs the use of projections on the outside diameter to maintain proper alignment of the fuel element in the process tube to minimize hot spot type failures. Wafers sectioned (HW-74335) Elements failed 4/14/62, 4/16/62 and 4/21/62, respectively (HW-73473)

August 1962 – Exam of 42" long UO_2-PuO_2 seven rod cluster element continuing in Radiometallurgy. More transverse and longitudinal sections made through region of high PuO_2 concentration (HW-74813)

August 7, 1962 – 1,800 gallons of bulk organic liquid from 321 disposed in 618-10. RSR indicates that 1800 gal tank trailer (organic waste) going to 300N, but no indication of disposal. Suggest that this went to 300-N cribs (316-4) rather than burial ground since some HW documents (e.g., HW-12107) use language such as "cribbed at the 300 North Area".

August 8, 1962 – A cask was used to deliver Zr-2 scrap and stainless steel waste from 326 Building to 618-10. (RSR-600212)

August 15, 1962 – Two Pu contaminated gloveboxes and associated duct work were disposed in 618-10. (RSR-070783)

August 26, 1962 – 1382 gallons of D12 EDPA to 618-10. (RSR 100108) RSR shows that the date should be 6/26/62 and that the liquid waste went to the "300-N Cribs" not 618-10. The 300-N Cribs, designated as 316-4, were used for disposal of 321 Bldg organic wastes. Also, HW-75127, page 118 of 195, (and multiple other documents) indicates that "D12 EDPA" should be "D2EHPA", which is di-2-ethylhexyl phosphoric acid.

August 28, 1962 – 5000 gallon of bulk liquid from 321 Bldg disposed in 618-10. HW-75108 (09/1962) indicates that "approximately 5000 gallons of low-level cesium-cerium waste solutions from the 321 storage tanks" was "transferred to the 300 North burial ground" and that "no contamination occurred as a result of the transfer". HW-75459 (10/1962) states that two shipments of low-level cerium waste from the 321 Bldg were completed using a tank trailer.

September 4, 1962 – Sent 14 CWS filters to burial ground. Three of them were from B-cell reading 60 R/hr., 40 R/hr. and 80 R/hr. (Sr-90). (Solid waste removed from 325A per Appendix A, HNF-EP-0649, temporary closure of 618-10 trenches suggests this waste went to 618-11 trenches)

September 12, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of a production fuel element that failed in tube 1372-H on 3/12/62 at 362 MWD/T exposure. Element sectioned to remove the cap. (RM 454) (HW-74681)

September 24, 1962 – 4" piping from 309 Bldg disposed in 618-10. (RSR dated 9/24/62, no # given)

September 24, 1962 – one 55 gallon drum with 1" lead lined (UO_2, PuO_2 works in C-cell) (Solid waste removed from 325A per Appendix A, HNF-EP-0649, temporary closure of 618-10 trenches suggests this waste went to 618-11 trenches)

September 25, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of an irradiated, Zr-2 pressure tube from KE loop 3. The purpose of the examination was to determine the effects of the reactor environment on strength and ductility of the pressure tube. (HW-75052)

October 1962 – Following closure of the Wye (618-11) burial ground, a new trench was prepared at 300-N Burial Ground. (HW-75459)

October 1962 – Trench 10 opens (at 618-10); trenches 11 and 12 staked out, unsure whether they were dug or used. (based on educated guess)

October 1962 – Exam complete on enriched split failure from tube 0567-H (RM C-402) (HW-75376)

October 3, 1962 – The Wye Burial Ground was closed on October 3, 1962 pending AEC review. A new burial trench was dug at 300 North and was put into use October 8, 1962. At 300 North, two more trenches were staked out. One was a small trench to accommodate the burial of a decontaminated cell from 327 Building, the other was to accommodate the burial of routine waste from the 300 Area. The 300 North was staked for extending the perimeter fence. The following summarizes waste disposal operations:

Concrete barrels disposed: 8* in August, 8* in September
Load luggers of waste disposed: 37** in August, 49** in September
*In the past the # of load luggers of barrels rather than the actual # of barrels were reported. In the future the actual # of barrels will be reported.
** Total load luggers disposed. Previously reported figures were for 325 waste disposal only. (HW-75376)

October 3, 1962– A-cell CWS filter, (1WW spray calciner work). (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

October 8, 1962 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of an enriched I&E fuel element discharged for KE Reactor as a hole failure with longitudinal splits after an exposure of 695 MWD/T. RM 451 Sectioned through rupture cavity. (HW-75197) Cause of failure of element from 2091-KE determined 09/62. (HW-75127) Element failed 3/28/62 at 695 MWD/T (HW-73473)

October 9, 1962 – One A-cell CWS filter. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

October 11, 1962 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination of a fuel failure in a PRTR test, 19 rod cluster after an exposure of 3 hours at 60 MW. The failed rod contained Zr-2 clad, $MgO-PuO_2$ and was fabricated to evaluate the irradiation performance of ceramic spike fuel. Investigation in progress since 08/62 25 ¼" section with rupture area in middle cut from 8' long element; two transverse samples and one longitudinal sample taken from sectioned piece. (HW-75248) Element ruptured 08/21/62 (HW-74813)

October 25.1962 – C-cell waste one 1" lead, 1 culvert 55 gallon drum (4 R/hr. at bottom of drum) and three 5 gallon buckets. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

October 26, 1962 – 1 A-cell CWS filter. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

October 29, 1962 – 1 A-cell CWS filter (60 R/hr.) (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

October 30, 1962 – Waste from thorium load logger (from 306 Building) disposed to 618-10. (RSR-602570)

October 31, 1962 – Project Proposal CAH-867, "Fuel Element Rupture Test Facility", complete. The PRTR fuel element rupture test facility was used to conduct tests of high risk or defected fuel elements under controlled conditions. (HW-63863, HW-75376)

October 31, 1962 – 1 A-cell CWS filter. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 1962 – Project Proposal CAH-866, "Shielded Analytical Lab, 325-B Building" completed. The project allows greater capacity for analytical work involving more highly radioactive solutions and consists of adding a shielded laboratory to the 325 Building. (HW-60232, HW-63015, HW-67411, HW-75625)

November 1, 1962 – C-cell two 1" lead drums and 2 culvert 55 gallon drums containing SST valves, fittings, tubing, glass and plastic. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 2, 1962 – C-cell waste 3 culvert 55 gallon drums (UO_2, PuO_2 work). (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 2 – 5, 1962 – 2 CMS (CWS?) filters from A-cell (1 at 70 R/hr. and 1 at 100 R/hr). (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 5, 1962 – Two 1" lead drums from C-cell waste. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 7, 1962 – A-cell CWS filter. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 13, 1962 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation results of a fuel failure in D Reactor tube 2166. Fretting/corrosion of the Al X-8000 clad resulting from vibration was cause of failure. Exposure calculated to be 811MWD/T. (HW-75318) Discharged 05/26/62; ½" wafer sectioned from largest rupture site (HW-75318)

November 29, 1962 – C-cell equipment removal one 4' x 4' x 8' wood box and two 55 gallon drums. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

November 30, 1962 – Contaminated equipment and material from 3718 Building disposed to 618-10. (RSR-602688) (The 3718 Building provided storage space, mechanical shops and office space)

December 1962 – Final report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of an irradiated, Zr-2 pressure tube from KE loop

1 that failed after 600 days of operation with fuel in the tube. The purpose of the examination was to determine failure mode and the effects of the reactor environment on strength and ductility of the pressure tube. (HW-67949)

December 1962 – Exam of hole failure of an enriched DR element was completed (RM C-409) (HW-75925)

December 3, 1962 – C-cell waste one 4' x 4' x 8' wood box and one 55 gallon drum. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

December 5, 1962 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of an enriched, bumpered fuel element discharged from H Reactor tube 0567-H with a split failure after an exposure of 1294 MWD/T. (HW-75701) Exam completed in 10/62 (HW-75376). Element failed 5/6/62 (HW-73777)

December 5, 1962 – A-cell CWS filter reading 400 R/hr. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

December 12, 1962 – Removed 4 waste cartons from room 603 reading up to 4 R/hr. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

December 14, 1962 – Project CGH-857, "Physical and Mechanical Properties Testing Cell -327 Bldg" completed. New cell installed for testing of irradiated materials. (HW-75925, HW-67088) Cell not operational until July 10, 1963 (HW-78420)

December 31, 1962 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation results of a fuel failure in D Reactor tube 2583. Grove/corrosion was cause of failure. Exposure calculated to be 902 MWD/T. (HW-75926) Examination (RM C-408) of element was occurring in 10/62 and 11/62 (HW-75376, HW-75625). Element failed 8/27/62 (HW-74780)

December 31, 1962 – Mini PUREX parts and concrete barrels for 325 Lab. disposed to 618-10. "Hood box" broke completely apart when placing into pit. Parts flew onto side of burial ground, possible Pu contamination on side of pit. (No RSR #)

December 31, 1962 – C (Met) Cell shut down (1st time in over 3 years) for 4 days for maintenance work on cathodic etcher and metallograph (HW-76315 A)

1963 – 327 Building performed waste tank sludge examination (Refer to July 1963 entry for info on activities performed on tank waste), SNC cermet fuel examination. (HNF-EP-0649)

January 1963 – Report issued describing the development and initial use of a prototype test chamber in which sections of irradiated pressure tubes from the Hanford reactors are burst at elevated temperatures. The development of the prototype equipment was

required to provide a basis for the design of a facility with a capacity of six test units. (See Project CAH-992 for six unit burst facility, March 1964 below) (HW-76158)

January 7, 1963 – Unknown quantity of oil drums were disposed in 618-10. (RSR-12347)

January 14, 1963 – 2 culvert 55 gallon drum from A-cell. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

January 24, 1963 – Seven items, tanks and lab equipment, from 3718 Building disposed at 618-10. (RSR-602859). (The 3718 Building provided storage space, mechanical shops and office space)

January 25, 1963 B-cell two 1" lead 55 gallon drums. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

January 28, 1963 – Refrigerator, metal grating disposed to 618-10. (RSR-602865)

February 1963 – Waste disposal during December/January were:
Concrete barrels: 12 in December, 8 in January
Load Luggers of dry waste: 27 in December, 29* in January
* Two of which went to the Wye Burial Ground (Pm-147 contaminated waste from 325) (HW-76596)

February 1963 – Exam completed on four hole failures from D and DR; two Nat. U and two enriched (HW-76596)

February 8, 1963 – A jug of "FP & Pu" from 325 Building was concreted in a drum and disposed in 618-10. (RSR-12612). C-cell 2 culvert 55 gallon drums, B-cell two 1" lead and two 2" lead drums. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

February 11, 1963 – 3 culvert and three 1" lead 55 gallon drums (A-cell 1WW waste), 3 CWS filters, 2 from A-cell, 1 from B-cell. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

February 12, 1963 – 2 culvert drums from A-cell. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

February 13, 1963 – 1 culvert drum from A-cell and one 1" lead drum. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

February 15, 1963 – We received 50,000 Ci of Sr-90, put into B-cell. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

February 28, 1963 - Roofing material, 1 control panel, 4 electric switch boxes, 20 ft. of 2" angle iron, 4' x 4' x .25" iron sheet, and 50 ft. of conduit from 321 Building disposed in burial ground. (RSR 602976)

March 1963 – Waste disposal for February included 20 concrete barrels, 29 load luggers of dry waste. (HW-77046)

March 6, 1963 – A Pu bottle from 308 was concreted in a drum for disposal. (RSR-12943)

March 26, 1963 – 2 culverts C-cell and 1 culvert A-cell (Pm in A-cell). (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

March 28, 1963 – A Pu pump and Pm-147 source from 308 Building were disposed in 618-10. (RSR-630512)

April 1963 – Exam of split failure 3584-C completed (RM C-417); nested, tubular, UO_2 PRTR element #1501 has been completely sampled and transverse sections from each element examined macroscopically. Small samples prepared for more detailed microscopic examination (RM C-618) (HW-77397)

April 10, 1963 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of two enriched fuel elements from DR Reactor with exposures of 701 and 799 MWD/T (Failed 10/7/62 (HW-75451), and two natural I&E elements from D Reactor with exposures of 872 (Failed 10/15/62 [HW-75451]) and 878 MWD/T (Failed 10/19/62 [HW-75451]). All 4 elements were bumpered and failed by groove pitting corrosion. (HW-76938) Exam completed February 1963 (HW-76596). Exam results for 3967-DR (799 MWD/T) reported 12/62 (HW-75931) and for 2166-D (872 MWD/T) 01/63 (HW-76315 A)

April 18, 1963 - Removed equipment from C-cell Pm contaminated put in a 3' x 3' x 6' wood box. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

April 19, 1963 – Removed CWS filters from cells exhaust. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

April 23, 1963 – Removed all equipment from C-cell (Pm work): glass pipes, tanks, trays, tables, valves. Put into 3 boxes 4' x 4' x 8'. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

May 1963 - Waste disposal for March/April:
Concrete barrels: 12 in March and 4 in April
Load luggers of dry waste: 28 in March and 29 in April. (HW-77709)

May 1963 – 34 samples were removed from 10 rods of Pu-Al PRTR element #5108. Samples to be processed to determine burnup and fission product distribution (RM C-

757). Forty irradiated metal or ceramic fuel element samples were dissolved for various tests including burn-up analysis. 43 "milk pail" and 3 "Gatling Gun" (30 cans) waste cask runs were made. (HW-77709)

May 1, 1953 – B-cell waste one 2" lead , 1 culvert 55 gallon drum. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

May 2, 1963 – A-cell one 1" lead, 1 culvert 55 gallon drum, 3" lined 55 gallon drum contains two 8" x 8" x 6" CWS filters from calciner off gas and vacuum lines and other materials. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

May 7, 1963 – Contaminated equipment from 3718 Building disposed to 618-10. (RSR-602688) (The 3718 Building provided storage space, mechanical shops and office space)

May 7, 1963 – Two 1" lead lined 55 gallon drums, contains SST tubing, Valves plastic, one 2" lead lined 55 gallon drums contains CWS filter from B-cell vacuum system. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

May 29, 1963 – Ducting from 325 Radiochemistry Laboratory disposed to 618-10. (RSR-130905)

May 31, 1963 – Irradiated fuel hangers from 309 Building were disposed to 618-10. Maximum reading 2.5 R/hr. through side of barrel at 2". (RSR-630949)

June 3, 1963 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of three irradiated fuel elements from B Reactor. Two elements failed due to unusual corrosion of the Al jacket. (HW-77797)

June 5, 1963 – Six barrels of contaminated waste (unknown contents) from 1171 Building Round House disposed to 618-10. (RSR-603299)

June 20, 1963 – A-cell CWS filter (exhaust). (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

July 1963 – Ruptured UO_2-PuO_2 rod from PRTR element 5113 was examined metallographically; ten rods from PRTR element 1006 were sectioned and 40 samples taken from burnup analysis, FP distribution, and metallography; specimen of Redox tank SX-114 cored waste material was recovered from core drill assembly, photographed, and shipped to the Redox lab for analysis; three selected Hanford production fuel elements sectioned and wafers for cryogenic studies were prepared; Chem Processes group of Radiometallurgy Laboratory dissolved 51 samples for burnup analysis and declad 11 Al-clad wafers. (HW-78420)

July 5, 1963 - 327 Radiometallurgy Laboratory performed post irradiation examination on three overbore elements discharged form 3062C on 4/16/62 with longitudinal splits

after an exposure of 676 MWD/T. The overbore concept involved enlarging some graphite channels (in C Reactor) by up to 550 mils to accommodate larger fuel elements which would allow for increased Pu production by 15 to 18%. All three elements were received at 327 on 7/5/63. All three were sectioned transversely near the center and sections were etched. (HW-79341)

July 15, 1963 A-cell 2 culvert 55 gallon drums, containing samples bottles, rags, metal, and plastic. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

July 16, 1963 – Irradiated fuel hanger extenders from 309 Building were disposed to 618-10. Maximum reading through side of barrel was 4 R/hr. at 18". (RSR-63?157)

July 19, 1963 – Six foot chisel removed from F Cell 327 Radiometallurgy Laboratory, bagged in plastic, placed in load lugger. (RSR-06497)

August 1963 - Waste disposal for June/July:
Concrete barrels: 8 in June and 12 in July
Load luggers of dry waste from 325 Bldg: 2 in June and 4 in July
Load luggers of dry waste from other 300 Area sites: 19 in June and 21 in July. (HW-78758)

August 13, 1963 – B-cell waste three 1" lead and one 2" lead 55 gallon drums of waste: glass sample vials, bottles, rags, and plastic. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

August 19, 1963 – one bottle containing Pu solution from 325 Lab disposed at burial ground. (RSR 131579)

August 22, 1963 – Contaminated graphite from 326 Building was disposed to 618-10. (RSR-600572)

August 26, 1963 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of an enriched I&E fuel element that failed by splitting into four separate pieces after an exposure of 584 MWD/T in H Reactor. RM C-420; element cleaned in nitric acid before "reassembly" for photos (HW-78507) Failed 3/31/63 (HW-77045)

August 30, 1963 – Zirconium scrap was disposed in 618-10. (RSR-07021)

September 1963 – PRTR Rupture Loop begins operation. (HNF-EP-0649)

September 1963 – Waste disposal for August:
Concrete barrels disposed at 300 North: 20
Load luggers of dry waste from 325 disposed at 300 North: 2
Load luggers of dry waste from other 300 Area sites disposed at 300 North: 22

As of September 16, 1963, all dry contaminated waste was buried at Wye Burial ground. Pu bearing waste was sent to 200 West Pu Burial Ground. (HW-79046) (Note however, that monthly reports subsequent to this September 1963 report show concreted barrel waste continued to be disposed of at Wye Burial Ground)

September 1963 – Policy decision resulting from a contamination spread in 618-10 prompted 300 Area labs, including 325, 326, 327 and 329 Buildings, to begin disposing of most Pu contaminated waste in 200 Area Burial Grounds. (WHC-MR-0388)

September 6, 1963 – A-cell CWS filter. (Solid waste removed from 325A per Appendix A, HNF-EP-0649)

September 16, 1963 – December 31, 1967 – Wye Burial Ground re-opens on September 16, 1963 and permanently closes on December 31, 1967. (HNF-EP-0649)

September 16, 1963 – 300 North Burial Ground permanently closes. (HNF-EP-0649)

October 1963 – GE memorandum recommends arrangements be made by the Hanford laboratories facilities to dispose of Pu or Sr-90 containing wastes to the 200 Area burial sites. (Letter to F. A. Albaugh from A. R. Keene, "Disposal of Wastes Containing Long-Lived Radioactive Materials", dated October 24, 1963)

October 1963 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
A-cell three 1" lead, three culverts, and one 2" lead 55-gallon drums, A-cell C.W.S. filter.

October 1963 – Monthly report states the following waste shipments for August. Twenty concrete waste barrels disposed to 300 North, two load luggers of dry waste from 325 disposed to 300 North, and 22 load luggers from other 300 Area facilities disposed to 300 North. (HW-79377)

November 1963 – Monthly report states the following waste shipments for September. Eight concrete waste barrels disposed to 300 North, one load lugger of dry waste from 325 disposed to 300 North, and 7 load luggers from other 300 Area facilities disposed to 300 North. (HW-79726)

November 1963 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
A-cell C.W.S. filter reading 30R/hr.,
A-cell two 1" lead, one 2" lead, three culvert 55-gallon drums.
A-cell two C.W.S. filters, reading on one was 2.7R/hr and the other 22R/hr. They were put into load lugger, then to burial ground.
C-cell Pu waste in one-gallon cans put in waste box.

December 1963 – Monthly report states: "In backfilling the 300-N Burial Ground, the AEC uranium barrels and about one-half of the last trench used have been covered. There are some miscellaneous pieces of equipment to be buried and the vertical barrels need to be backfilled and capped with concrete." (HW-79999)

December 1963 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
A-cell C.W.S. filter reading 30R/hr.
A-cell two 1" lead, one 2" lead, three culvert 55-gallon drums.
A-cell two C.W.S. filters, reading on one was 2.7R/hr and the other 22R/hr. They were put into load lugger, then to burial ground.
C-cell Pu waste in one-gallon cans put in waste box.

1963-1964 – N Reactor startup. (DOE/RL-97-1047)

1964 – 327 Building supports aluminum/aluminum lithium, waste glass concentration and British fuel and material examinations. (HNF-EP-0649)

January 1964 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Pulled 10 C.W.S. filter.
Six one-gallon cans from A-cell, using the new 1 ton cask.
Three one-gallon cans C-cell, Pu waste.
Six one-gallon cans C-cell.

February 1964 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Eleven one-gallon cans from A and B cells.
A-cell C.W.S. filter.

March 1964 – Physical Completion Notice issued by GE for project CAH-922, "Burst Test Facility for Irradiated Zirconium Tubes" for 327 Building. (HW-81472, HW-69283)

March 1964 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
B-cell waste into 15-gallon black iron can <u>using the new 7 ton waste cask</u>.
C-cell one 15-gallon can (Pu, UO_2, work).
A-cell C.W.S. filter (150R/hr).
A-cell six one-gallon cans.
C-cell one 15-gallon can and six one-gallon cans.
A and B cell, twelve one-gallon cans.

April 1964 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
C-cell three one-gallon and one 15-gallon cans.
A-cell C.W.S. filter.
C-cell one 15-gallon can.

May 1964 – PRF (Pu Reclamation Facility) startup. (RECUPLEX process) (DOE/RL-97-1047)

May 1964 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
C-cell C.W.S. filter (UO_2).

A-cell nine one-gallon cans (Sr^{90}, Ce).

June 1964 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
C.W.S. filters from A, B, and C cells three.
Waste from A, B, and C cells twelve one-gallon cans.
C-cell C.W.S. filter (UO_2, dust) changed out the C.W.S. filter on C for the second time (2 filters), one reading 80R/hr. Changed C.W.S. filters on A and B cells (2 filters), one reading 90R/hr.
C-cell C.W.S. filter (reading 80R/hr) decladding fuel rods.
Eight E.W.S. filters changed out.
Two A and B cell filter changed out.
A-cell waste six one-gallon cans and two 15-gallon container with calcined 1WW from PUREX.
Twelve one-gallon cans and 4 containers with calcined pots of 1WW waste.
C-cell C.W.S. filter change.
A-cell two calciner pots and six one-gallon cans.
A-cell four calciner pots.
Two C.W.S. filters from B and C cell.
A-cell waste two 15-gallon cans.
A-cell two 5-gallon buckets and one 15-gallon can.

July 1964 – Radiometallurgy Laboratory examines first fuel failure from N Reactor. (HW-83719)

July 1964 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
C-cell C.W.S. filter.
Two 5-gallon cans from A-cell and two 5-gallon cans from C-cell contain carbon electrodes from Pu work.
A-cell eight one-gallon cans.
C-cell C.W.S. filters.
Two 5-gallon cans A-cell, tow 5-gallon cans B-cell, three one-gallon cans C-cell.
C-cell C.W.S. filter.

August 1964 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
C-cell C.W.S. filter (Pu, UO_2).
C-cell four 5-gallon cans.

September 1964 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
C-cell two 5-gallon cans, B-cell two 5-gallon cans.
Two C.W.S. filters.
Two 5-gallon cans A-cell, two 5-gallon cans from B-cellk and two 5-gallon cans from C-cell.
A and C-cell C.W.S. filters.
B-cell C.W.S. filter (thorium work in cell).

September 1, 1964 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of four production fuel elements that were suspected of being over heated due to unusual conditions during shutdown. (No reactor or technical data provided in report) (HW-84389)

October 1964 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
C-cell four 5-gallon cans and six one-gallon cans.
A and B cell C.W.S. filters two.
B-cell two 50-gallon cans and three one-gallon .
A and C cell C.W.S. filters two.
B and C cell C.W.S. filters two.

November 1964 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Solution came out under C-cell door it was cleaned up with absorbent and rags. Put waste into four waste boxes, they were reading (4R/hr).
C-cell C.W.S. filter two.
C-cell C.W.S. filter one. Six one-gallon and four 5-gallon cans.
There were twelve C.W.S. filter change outs on the fuel decladding operation in C-cell.

November 19, 1964 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of the surface film (crud) deposited on one failed fuel element removed from N Reactor in the July 1964 time frame. (HW-84524)

December 1964 – DR Reactor shutdown. (DOE/RL-97-1047)

December 1964 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Two 5-gallon cans from B-cell, one 15-gallon and six one-gallon from C-cell.
Two 5-gallon cans B-cell and one 15-gallon can C-cell.
Five C.W.S. filters from C-cell work.

1965 – N Reactor fuel element examinations. Thorium oxide examinations. (HNF-10230)

1965 – 1972 – 327 Bldg performs fuels and materials examination for NASA. (HNF-EP-0649) Most records retained by NASA. (HNF-10230)

January 1965 – BMI assumes responsibility for management of Hanford Site Labs. (DOE/RL-97-1047)

January 1965 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
A-cell two 5-gallon cans.
A and B-cell six 5-gallon cans.
Changed out all C.W.S. filters, ten in all.

January 1965 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of two irradiated, Zr-2 pressure tubes from PRTR. The

purpose of the examination was to confirm a new criteria for PRTR pressure tube selection for destructive examination. The new criteria includes crack propagation, notch sensitivity, hydrogen concentration as well as the existing criteria of neutron exposure. (BNWL-5)

January 1965 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of five types of irradiated, Zr-2 pressure tubes. Three were from N Reactor, two from KER. The purpose of the examination was to relate performance to the different manufacturing techniques used to make the tubes. (BNWL-8)

February 2, 1965 - Solid waste removed from 325A per Appendix A, HNF-EP-0649: Starting A-cell clean out of the spray calciner equipment. There were thirtyseven 15-gallon containers with cut up SST items, calciner, rakes, valves, pumps, air motors, 8"x8"x6" C.W.S. filters, and calcinated 1WW pots.

February 11, 1965 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination results of several sections of a Zircaloy-2 overbore process tube from
C Reactor. (BNWC-31)

March 1965 - Report issued describing the results of 327 Radiometallurgy Laboratory post irradiation examination of two types of irradiated, Zr-2 pressure tubes. One was from KER loop 1 and the other from KER loop 2. The purpose of the examination was to relate performance to the different manufacturing techniques used to make the tubes. (BNWL-42)

March 1965 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
C-cell C.W.S. filter two.
C-cell C.W.S. filter one reading 70R/hr.
Several 30-gallon drums containing lead bricks from A-cell.
Eight C.W.S. filters.
Three C.W.S. filters.

April 1965 – H Reactor shutdown. (DOE/RL-97-1047)

April 1965 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Seventeen wood boxes 4'x4'x8' containing tanks, trays, dunnage, and insulation.
One C.W.S. filter C-cell.
Two 1-gallon cans C-cell.
Six 15-gallon cans and three 1-gallon cans B-cell.

May 1965 –
One C.W.S. filter C-cell.
Two 2'x3'x4' wood boxes of B-cell equipment: large press, one oven and one tube furnace.

One C.W.S. filter C-cell.

June 1965 – F Reactor shutdown. (DOE/RL-97-1047)

June 1965 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Four 5-gallon cans from C-cell Pu, UO_2 work.
Two C.W.S. filters C-cell.

September 1965 – PRTR major radiation (fuel release) incident. (HNF-EP-0649)

October 1965 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Fifty 15-gallon Black iron cans containing C-cell equipment removed: glass, stainless steel valves, tubing, rakes, condensers, small tanks, pumps, rotometers, and four C.W.S. filters.
Six 5-gallon buckets from B-cell.

October 17, 1965 to January 4, 1966 – Three fuel element failures occurred at N Reactor and were examined at 327 Radiometallurgy Laboratory to determine the failure mechanism. Exposures were 1270, 600 and 800 MWD/T. (C-3458, BNWL-CC-9764)

November 1965 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Six wood boxes 4'x 4'x8' containing large tanks, trays, tubing, tools, skillsaw, and wrenches.
One C.W.S. filter C-cell.
Two 5-gallon cans from B-cell.
Two 4'x 4'x8' wood boxes containing the C-cell crane and parts, and miscellaneous junk.

December 1965 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Three C.W.S. filters.
Two 5-gallon cans B-cell.

1966 – 324 Chemical Engineering Building construction completed. (WHC-MR-0293)

January 19, 1966 – Report issued stating that 6 fuel elements were examined from 1053-KW and sustained a rupture shortly after start-up. Six elements were examined by 327 Radiometallurgy Laboratory to determine that an obstruction in the internal cooling annulus restricted coolant flow that lead to failure. (BNWL-CC-443)

March 1966 – Report issued documenting the results of a study performed in 327 Radiometallurgy Laboratory to determine what operations in the lab caused major releases of I-131 and to determine the collection efficiency of the charcoal filter in the vent system for I-131. (BNWL-CC-533)

March 1966 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
One 5-gallon can C-cell Pm^{147} oxide work.

Two 15-gallon SST resin cans from A-cell Pm^{147}.
Four 5-gallon cans B-cell.
Two 5-gallon cans and one 15-gallon can from A-cell.
Three 15-gallon cans into one large container A-cell.

April 1966 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Four 5-gallon cans form A-cell Pm work.
One 4x4x8 foot wood box with trays, press, and stands from Pm work.

May 1966 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
(this one has a 1965 date but is listed in the 1966 category.) Three C.W.S. filters.
Two 5-gallon cans and one 15-gallon resin can from Pm work.

June 1966 – Zr-2 tube #1756 was removed from N Reactor in accordance with planned surveillance procedures. Test specimens were cut to length and measured for diameter and wall thickness in the 327 Radiometallurgy Laboratory hot cells. Detailed examination was performed in the Irradiated Tube Testing Facility of the 327 Lab. (BNWL-CC-1092)

June 1966 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Three C.W.S. filters.
Six 5-gallon cans glass, poly tubing, valves, rags, and plastic.
Four 15-gallon black iron cans. A-cell waste.

August 1966 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Four 5-gallon cans.

September 1966 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Four 15-gallon SST resin cans.
Two 15-gallon black iron cans.
Four 5-gallon cans.
Four 5-gallon cans from A-cell.

November 1966 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Six 5-gallon cans B-cell Sr^{90}, Ce, Cs.
Four 40-gallon tanks from room 40A.
Four 15-gallon resin cans from A-cell.

December 1966 - Solid waste removed from 325A per Appendix A, HNF-EP-0649: Six 5-gallon cans C-cell Np (Neptunium) work.

January 1967 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Three C.W.S. filters reading 500R/hr.
Two 5-gallon cans from B-cell and four 5-gallon cans from A-cell.

February 1967 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:

Two 5-gallon cans from C-cell and four 5-gallon cans from B-cell.
Ten C.W.S. filters.
Two 5-gallon cans and one 15-gallon resin can.

December 9, 1966 – Report was issued describing N Reactor irradiation test of 33 Zr-2 canned $AlLiO_2$ targets. Each Zr-2 canned target contained 2 Al canned ceramic cores. Following irradiation, 37 of the 66 Al canned targets were shipped to Savanah River Project for analysis. Of the remaining 29 Al canned targets, several were analyzed in the 327 Lab. These targets were irradiated to provide material for evaluation of a process for extracting tritium from lithium bearing ceramics and to evaluate the in-reactor performance of lithium bearing ceramic target elements fabricated by several processes. The 327 Radiometallurgy Laboratory examination consisted of visual examination and dimensional measurements of the Zr-2 and Al target cans and sampling and measurements of the gas volumes in the gap between the Zr-2 and Al, and the gas in the Al cans. (BNWL-CC-945)

March 1967 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Four 5-gallon cans and one 15-gallon resin can.
Four 5-gallon cans from A-cell Pr work.
One C.W.S. filter from B-cell Np work.
Two C.W.S. filters from C-cell and one C.W.S. filter with charcoal for iodine.
Seven 15-gallon resin cans from A-cell Pm work.

March 10, 1967 - Report was issued describing 327 Radiometallurgy Laboratory examination of 3 failed N Reactor driver-target fuel assemblies after exposures of 600, 800 and 1270 MWD/T (average tube exposures). Each assembly contained 0.95% enriched U. (C-3458)

April 1967 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Three 15-gallon black iron cans.
Eighteen 5-gallon cans C-cell.
Two 5-gallon cans from B-cell Np work and one 15-gallon A-cell Pm waste can.

May 1967 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Two wood boxes containing glass pipe, 16" OD x 9', and 8" OD x 9' long.
Two 5-gallon glass containers with resin and 55-gallon drum with absorbing compound and vacuum pump oil.

1967 – Heat source examinations including cesium chloride, promethium oxide, and strontium. (HNF-10230)

June 1967 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Fourteen 5-gallon cans B and C cells.
Waste cartons that contained rags with Pu^{238}, wipes from spill in room 603.

June 1967 – D Reactor shutdown. (DOE/RL-97-1047)

June 1967 – High Temperature Lattice Test Reactor, 318 Building complete. (DOE/RL-97-1047)

June 13, 1967 – Pm ^{147} release from 325 Lab. An estimated 0.1 Ci was released to atmosphere and 0.65 Ci was released to the Retention Process Sewer and ended up in Process Pond. (BNWL-CC-1279)

July 1967 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Nine C.W.S. filters.
Six 5-gallon cans from C-cell.
Six 5-gallon cans from B-cell.
One 4'x4'x8' wood box contains lumber, plastic, and rags.

August 1967 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Four 5-gallon cans from B and C-cell.
Three C.W.S. filters vault exhaust reading 1.5R/hr, 9R/hr, and 4R/hr.

September 1967 – Atlantic Richfield Hanford Co. assumes responsibility for chemical processing. (DOE/RL-97-1047)

September 1967 - Solid waste removed from 325A per Appendix A, HNF-EP-649:
Eight 15-gallon resin cans and two 5-gallon cans from A-cell.
Eight 5-gallon cans from Pm work.
Six 5-gallon cans from Pu work.

October 1967 – Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Six 5-gallon cans from A-cell Pm and one 15-gallon resin can.
Eight 5-gallon cans from A-cell.
Eight 5-gallon cans from C-cell.

November 1967 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Three 4'x 4' x 8' wood boxes, equipment from A-cell: glass column, metal, wood, and plastic.
One 4'x 4' x 8' wood box contains ¾" plywood used as shielding, lead, plastic, rags, and 2"x 4"s.
Four 5-gallon cans from C-cell.
Three 15-gallon resin cans from A-cell and two 5-gallon cans from C-cell.
Two 5-gallon cans from C-cell.

November 1, 1967 – Report was issued describing the examination at PNL (327 and 325 Labs) of EBR-II irradiated and unirradiated metallic U fuel elements of U-5 wt% Fs. Fs means "fissium" and is formed as follows: Discharged EBR-II fuel is remotely reprocessed in a "pyro-metallurgy" facility, cast into rods, and assembled into fuel elements. During the pyrometallurgical process the fuel is held molten for several hours to remove the volatile fission products via boiling while Ba and Sr react with the zirconia

crucible and adhere to the crucible walls. Zr can be removed by some degree by carbide drossing. The other fission products are not removed and eventually build up to an equilibrium level. These elements are called "fissium" (Fs). The purpose of the examination at PNL was to identify the nature of the swelling occurring in 3 types of U-5 wt % Fs alloys and to determine the microstructural differences of the 3 alloys. All three alloy types are U-5 wt% Fs and have the same nominal composition: 2.5 wt. % Mo, 2.0 wt. % Ru, 0.3 wt. % Rh, 0.2 wt. % Pd, 0.08 wt. % Zr, 0.01 wt. % Nb, and the balance U. (BNWL-CC-1441)

December 1967 – S Plant shutdown (REDOX processing). (DOE/RL-1047)

December 1967 - Solid waste removed from 325A per Appendix A, HNF-EP-0649:
Three 15-gallon resin cans from A-cell.
Six 5-gallon cans from A-cell.
Three 15-gallon resin cans.
Twelve 5-gallon cans from A-cell and one resin can.
Four 5-gallon cans from B and C-cells.

December 31, 1967 – Wye Burial Ground shut down, all 300 Area waste shipped to 200 Area for burial. (HNF-EP-0649)

1968 – Corrosion evaluation and examination of Naval heat exchanger materials. (HNF-10230)

1968 to 1978 – 325 Lab performed experiments to develop a process for removing Sr and Cs fission products from waste streams using various metal ferro-and ferricyanides. Developed flowsheet for B-plant Sr-90/Cs-137 recovery process. Studied strontium fluoride and cesium chloride encapsulation chemistry for B Plant. Performed experiments for recovery of Pu-238 from irradiated neptunium-237/aluminum target material. (WHC-MR-0388, HW-48832, HW-31444)

January 26, 1968 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation results of a fuel failure in B Reactor tube 3486. Fretting/corrosion resulting from vibration was cause of failure. Exposure calculated to be 1479 MWD/T. (DUN 3775)

February 1968 – B Reactor Shutdown. (DOE/RL-97-1047)

February 26, 1968 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation results of a fuel failure in KE Reactor. Longitudinal core splitting was cause of failure. Exposure calculated to be 630 MWD/T. (DUN 3896)

February 29, 1968 - Report was issued describing post irradiation examination results of Hanford production tests designed to evaluate several U alloys as fuels for high power density fuel elements. During ultrasonic inspection of elements in the C basin, several fuel core cracks were detected, although there were no failures. Two cracked core

elements and 12 elements without indications of cracks were examined in the 327 Radiometallurgy Laboratory. (BNWL-CC-1365)

July 19, 1968 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation results of fuel failures in KE tube 2863. Exposure calculated to be 634 MWD/T. Clad material was X8001 alloy. (DUN-4501)

1969 – Fuel and cladding examination of Jersey Nuclear irradiated fuel rod. (HNF-10230)

April 1969 – C Reactor shutdown. (DOE/RL-97-1047)

July 2, 1969 – Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination results of the first Process Tubes removed from N Reactor after exposures of 8E+20 and 1.2E+21 nvt (E>1Mev). (BNWL-CC-2195)

1970 – AEC directive establishing the basis for TRU waste and the requirement for 20 years storage was issued. (WHC EP-0696)

1970 – At Hanford, Solid Waste Burial Records (SWBR) were instituted and used for all waste containers, although the information on physical contents and hazardous constituents was limited. (WHC EP-0696)

1970's – Special Environmental Research Facility (SERF Cell) was added to provide inert examination of UMR fuels and materials. Initiate assembly, disassembly and examination of EBR-II TREAT and GETR TREAT reactor test vessels. Fabrication and tensile testing of Navel curved fuel plates. (HNF-10230)

1970 through 1983 – Provide surveillance and rupture /failure analysis for FFTF fuel elements and materials. (HNF-10230)

February 1970 – KW Reactor shutdown. (DOE/RL-97-1047)

July 1970 – KE Reactor shutdown. (DOE/RL-97-1047)

1971 – Yankee reactor fuel element examination

1971 to 1972 – PRTR fuel shipped to PUREX. (HNF-EP-0649)

February 3, 1971 - 300 North Burial ground soil sample analysis indicates gamma emitting nuclides present in the following proportions:
CePr-144, 46%
Eu-155, 44%
Eu-154, 10%
Trace of Cs-137

No detect for Eu-152 and Eu-156 (Reference WADCO Memo MR Weiler to GM Rolph dated 2/3/71)

1972 – UO_3 Plant shutdown. (DOE/RL-97-1047)

1972 – PUREX placed on stand-by.

1973 to 1979 – AEC further defines TRU waste as material contaminated with certain alpha-emitting radionuclides with half-lives greater than 20 years and activity greater than 100 nCi/g. Hanford record keeping improved. (WHC EP-0696)

1977 to 1980s – 325 Lab performed studies in support of DOE Nuclear Waste Vitrification Project (NWVP), performed experiments in high level waste behavior during thermal concentration and performed light water reactor fuel dissolution tests for waste partitioning. Demonstrated molten salt electrodeposition of UO_2 and PuO_2 and supported FFTF development. (WHC-MR-0388)

1980 - Gas cooled fast reactor fuel pin depressurizing and resealing for EBR-II fuel cladding transient testing at D Cell.

1980 – Core drilling at 618-10 identified mixed soil components as primarily Pb-214, Ra-226, Th-208, Bi-212, Bi-214, Ac-228 and Cs-137 and K-40. (WHC-MR-0388)

1980 – NWVP work at 325 Lab placed on standby by DOE and much contaminated material left in A, B, C Cells due to budget issues. Remaining cells supported leach testing on glass waste and spent nuclear fuel, post-irradiation of examination of the boron thermal shield from N Reactor, characterization of neutralized cladding removal waste (along with testing of a potential method of converting it to non-TRU waste). Other radiochemical work included characterization of DST waste, tests of iodine control, N Reactor fuel dissolution methods and experiments in the recovery of Sr using antimonic acid. (WHC-MR-0388, HW-58329, HW-76596-A)

1980 – 1996 – Examination and characterization of commercial reactor spent fuels including HB Robinson, Turkey Point, preparation of NNWSI series I leach test, TUFF repository fuel corrosion testing. (HNF-10230)

February 1980 – FFTF startup. (DOE/RL-97-1047)

1982 – Definition of TRU waste activity increased to100 nCi/g by DOE. (WHC EP-0696)

1983 - PUREX re-started to process N Reactor fuel

1983 – 1989 – Examination of DOE/Power Reactor & Nuclear Development Corporation of Japan fuel pins and their cladding. (HNF-10230)

1984 – Corrosion and crud film thermo conductivity testing of Naval fuel plates, examination of tritium and lithium target elements. (HNF-10230)

1985 – Examination of WESF cesium chloride capsule materials. (HNF-10230)

1986 – 1995 – Examination of Space Power fuel pins, fuel emitters, and thermionics materials. (HNF-10230)

Jan 1987 – N Reactor shutdown. (DOE/RL-97-1047)

1988 – PUREX shutdown. (DOE/RL-97-1047)

December 13, 1988 - Report issued summarizing the results of 327 Radiometallurgy Laboratory post irradiation examination results of an SP-1 fuel assembly irradiated to 3 atom % burnup in the EBR-II Reactor. The test was designed to provide irradiation data on uranium nitride and uranium dioxide fuel pins for the SP-100 space program. (WHC-88-310)

May 1989 – PFP Shutdown. (DOE/RL-97-1047)

1990 – 1993 – Examination of Knolls Atomic Power Laboratory (KAPL) materials. (HNF-10230)

1994 – 1995 – Characterization of KE, KW, and N reactor fuel elements. (HNF-10230)

July 2007 – *Acceptable Knowledge Document for 325 Building Radiochemistry Laboratory Mixed Debris Waste Stream, RLM325D*, Rev. 1 issued as HNF-30810

December 2008 – *Acceptable Knowledge Summary Report for Mixed Transuranic Waste from 300 Area Facilities* was issued as WMP-31733

IHE-2009-0006
Rev 3

ATTACHMENT 3

618-10 Trench Burials (a partial list of potential anomalies)

This is a list of items known to have been disposed to the trenches in the 618-10 Burial Ground over its lifetime. The items in Sheet #1 of the attachment represent a small fraction of the total items disposed and are presented below to provide and understanding of the wide variety of waste expected to be exhumed from the trenches. Sheet # 2 lists trench waste items in more general terms. A copy of the referenced RSRs is also included in the IHE.

ITEM	BUILDING #	RSR / HW REFERENCE	DATE
Chain hook, choker cables and gloves	305B	606338	3/9/61
Centerless grinder	306	110320	10/15/57
Two barrels of uranium (form unknown)	306	110046	3/1/59
Drum, cooling liquid from Th lathe	306	600304	12/5/61
Drum, Sr and Th waste	306	600958	6/21/61
Ducting and cyclone separators	306	HW-66280	7/11/60
Irradiated fuel hangers in concrete drums	309	630949	5/31/63
Pu pump and Pm -147 source	309	630512	3/28/63
Vibrators, manometer, motor, hard hats	321	502361	11/4/59
Electric motor and switches	321	600077	2/18/60
Pump and motor	321	600220	5/24/60
Roofing material, angle iron, bolt cutters	321	602976	2/28/63
Hood, chemical pumps, space heaters, stainless scrap	321	600192	5/9/60
Drum containing resin	325A	4648	1/10/61
Drum containing resin	325A	5036	1/30/61
Hg waste in waste carton	325	4776	1/16/60
Three Pu contaminated gloveboxes	325	4400	12/21/60
Pu contaminated glovebox	325	5372	2/21/61
Pu contaminated glovebox	325	7180	7/19/61
Square cask	325	6643	6/6/61
Pu glovebox	325	7226	7/24/61
Vacuum cleaner	325	7821	9/12/61
Glovebox	325A	8216	10/13/61
Drum of cyanide powder	325	810114	11/26/57
Sr-90 glove hood	325A	8311	10/20/61
Lucite hood	325	8714	11/22/61
Pu contaminated ducting	325	9360	1/16/62
Pu contaminated vacuum cleaner	325	9363	1/16/62
Pu contaminated stainless steel sink, ducting, two gloveboxes	325	10783	8/15/62
Pu contaminated "mini" mixer apparatus	325	9445	1/25/62
Pu contaminated boxed "mini PUREX" plant	325	None *	12/31/62
Oil drums	325	12347	1/7/63
Metal cans of Zr turnings	325	2192	6/6/60
Glass vial of uranium sulfate	325	4335	12/19/60
Pu drum	325	2688	7/28/60
Zr shavings and UO_2 waste	325	789	1/22/60
Zr-2 waste	325	600162	6/13/62
Lead bricks and centrifuge base	325	148	1/18/55

Ducts, wood table, Pb bricks	325	130905	5/29/63
One tank, 3 boxes of tubing	326	320127	3/28/58
Oven, plant made	326	52264	8/7/56
Contaminated furnace	326	310557	7/9/58
Irradiated graphite samples	326	600560	8/15/63
Glove box	326	310466	2/21/58
Tank/cask	326	398041	4/7/58
Thermocouple wires, bottle of graphite dust	326	310480	3/5/58
Co-60 sources (may have gone to VPUs)	326	320160	6/16/58
Two rusty casks (contents unknown)	325	6481	5/23/61
Hg waste in bottles in concreted drum	325	4922	1/24/61
Broken graphite blocks	327	61334	1/27/55
Liquid waste, U-Al in nitric acid	327	412273	8/29/57
Dissolver solution to waste box	327	411822	6/10/59
Al tubing in waste box	327	413672	12/17/59
Stainless steel waste line	327	860085	5/14/58
Sample mount press	327	412761	10/10/1957
Loose U-silica compound	327	61196	1/17/54
Steel cave	327	411131	4/25/57
Steel cave	327	818046	4/25/57
Two waste boxes, 150 R/hr., 75 R/hr.	327	90366	10/22/54
Load lugger of Th waste	327	603580	8/22/63
Acetone and nitric acid waste box	327	625622	12/16/55
Waste box containing cutt-off cell waste	327	60906	7/22/54
Contaminated lathe	327	626406	3/1/56
Al cuttings in waste carton	327	51856	12/7/55
Zr shavings in waste carton	327	528452	10/16/56
Sanding discs in waste box, 100 R/hr	327	626614	3/23/56
Cement bucket containing cut-off sludge (from 327 Bldg)	327	400301	6/23/54
Irradiated Al	327	528525	10/24/56
NaK (sodium-potassium alloy) waste 327	327	410108	1/5/57
Lead pencils, lead bricks and microscope stage	327	200348	10/5/54
Contaminated electrical equipment (furnace, pump, motors)	327	626807	4/10/56
Fifteen blowers, electric wires, conduit	327	59150	6/16/59
Four pumps, milling machine, two gloveboxes	327	412207	7/20/59
Hood, die table,molding machine	327	412207	7/21/59
Glove box, waste boxes	327	412680	9/3/59
Swage machine	327	602641	11/19/62
Uranium cylinder	327	91825	5/1/56
Six foot long chisel	327	6497	7/19/63
Sample polisher	327	528041	8/29/56
Coffer dam, two jacks	327	6374	7/11/63
Ru-106 waste in box	329	200289	9/3/54
Calcium sulfate in box (from 100 F Area)	329	81	10/17/56
Three gloveboxes	3706	400195	5/10/54
Two gloveboxes, 10 mg to 50mg Pu	3706	400285A	4/2/54
Contaminated sinks	3706	80704	11/8/54
Hood, benches, pipes	3706	80797	12/9/54
Contaminated wall panel, electric fixtures	3706	81301	3/24/55

Lathes	3706	91293	12/12/59
Scaffolding, planks, tools	3706	860039	1/20/58
Dumpster Box, refrigerator and metal grating	3706	602865	1/28/63
Steel tank and glovebox	3706	860015	6/5/59
Hacksaw, tin snips, hammer, screwdriver, dikes, vicegrips	3706	860044	1/23/58
Lathes mounted on timbers	Unknown	200472	2/18/57
Scrap metal, brake shoes, battery, hoses	1171	1717	9/2/55
Two rail car wheels	1171	680280	6/7/57
Lathe, milling machine, cutoff wheel	3741	51932	1/21/55
Milling machine and lathe	3741	51931	1/20/55
Pb bricks	3741	51924	1/17/55
3741 Building and foundation	3741	HW-41205	1/2/56
Telephone	3741	51933	1/20/55
Sb-Be source	3745B	836602	12/16/58
Liquid C-14, solid Sr-90 from Univ of Washington		3628	9/11/56
Th waste (drums/boxes) from Bureau of Mines		HW-39257	9/1/55
286 barrels of DU scrap from Univ of Calif		HW-55940	4/1/58
33 barrels of DU scrap from Univ of Calif		HW-59930	3/18/59
160 barrels of DU scrap from Rocky Flats		HW-59107	1/30/59
168 drums/4 boxes DU scrap from Univ of Calif		HW-65994	6/1/60
10 drums of DU scrap from Metallurgical Corp		HW-65994	6/1/60
58 drums DU scrap from Dow Chemical Corp		HW-65994	6/1/60
Decontamination cell (20' x 8' x 10', likely to have been disposed in 3 pieces)	327	HW-75376 **	Unknown

* No # was assigned to this RSR, see last page in attached RSRs for copy

** Trench 11 in the 618-10 Burial Ground was dug specifically for disposal of this cell, but it is uncertain that the cell was buried in trench 11 prior to closing the burial

ATTACHMENT 3 (Continued)

618-10 Trench Waste In More Generral Terms

Hundreds (maybe thousands) of activated/contaminated Pb bricks

Between 1100 and 1300 concreted lined drums

Approximately 750 drums containing depleted uranium

Approximately 40 drums of thorium waste (form unknown)

An unknown # of drums containing oil, other lubricants and solvents

An unknown # of drums containing U turnings, Al turnings, stainless steel turnings and Zr-2/Be turnings.

An unknown # of drums containing miscellaneous equipment, tools, lab supplies, parts and debris

Lab equip/supplies usually in cardboard/plywood boxes (Ex. hoses, gaskets, clamps, metal, glass and plastic tubing, fittings, valves, plastic bottles, glassware, balances, variac parts, tweezers, etc.)

Many truck loads of contaminated construction debris (Ex. lumber, concrete, rebar, asphalt, scrap metal, dirt/gravel/rocks, etc)

HEPA and CWS filters (usually in plastic then plywood box)

All kinds of PPE

UNCLASSIFIED

SURVEY NO. 00081 X

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
329	4-A	Special	10-17-56	1100 ~~AM~~ PM

DESCRIPTION

Survey of room 4-A for suspected ruthenium contamination.

ROUTINE MIN.	SPECIAL	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.
	1 X 60 MIN.		

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	$CaSO_4$ - Drying agent	~~Pippy~~ M.W. HGM		<500						WO 20,000 / WC
2.	Two glass tubes in #1 hood used to contain $CaSO_4$	~~Pippy~~ M.W. HGM		<500						WO 8000 / WC
3.	Hood #1 + equipment	~~Pippy~~ M.W. HGM		<500						WO <100 / WC
4.	Floor - Direct + smear survey	~~Pippy~~ M.W. HGM		<500						WO <100 / WC
5.	Two personnel	~~Pippy~~ M.W. HGM		<500						WO <100 / WC
6.	Shelves + equipment	~~Pippy~~ M.W. HGM		<500						WO <100 / WC

REMARKS:

No spread of contamination from $CaSO_4$ detected.

Glass tubes cleaned and replaced in hood.

$CaSO_4$ received from 100-F area.

$CaSO_4$ placed in waste carton & placed in leadlugger for transport to burial ground.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 20,000 c/m

MAXIMUM DOSE RATE

SIGNED J. L. Mayfield

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 789

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
300N Burial ground		S. O. P.	7-22-60	3:00 AM PM

DESCRIPTION

Monitor for transportation to trade Zr turnings & VO_2 waste to burial ground.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
										WO
										WC
	R/M thru side of barrel	gm								WO 2000
										WC
										WO
										WC
	D/R at lip of pit	CP						5	F	WO
										WC
										WO
										WC
	Check of personnel									WO
										WC
	& truck at end									WO
										WC
	of job.									WO <100
		gm								WC
										WO
										WC
										WO
										WC

REMARKS:

No spread of contamination detected.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 5 mr/hr.

MAXIMUM DOSE RATE 5 mr/hr

SIGNED C. A. Nordland

UNCLASSIFIED

AEC-GS, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 0148

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE Delayed Entry	TIME OF SURVEY
325	7-4F		1-18-55	1100 AM PM

DESCRIPTION

Monitor Removal of Waste Cask, Lead Brick, and centrifuge base in cave.

ROUTINE MIN. | SPECIAL 1 hr. MIN. | SWP INTERMITTENT MIN. | SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Waste cask	CP						500	2" o.s	WO / WC
	Waste cask	"						100	12"	WO / WC
										WO / WC
	Lead Brick	"				12.5 rads	S	18	2"	WO / WC
										WO / WC
	Plastic lid of cave	"				4 rads	S	60	2"	WO / WC
	Exp. Rate at center of cave.	"				80	F	8	F	WO / WC
	Cotton Glove	EGM								WO / WC 12:00

REMARKS: Lid cleaned to < 6 mrads/hr.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 12.5 rads/hr incl. 18 mr/hr.

MAXIMUM EXPOSURE RATE: 80 mrads/hr.

SIGNED V. J. Reginbal

UNCLASSIFIED

J-94-DS (2-54) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 01717

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
1171	Roundhouse		9-2-55	1000 AM PM

DESCRIPTION: Special survey of various and sundrie scrap material. Brake shoes - air hoses & battery.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	30 & 2 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max contam on									WO
										WC
	Battery & hoses	TGm								WO 300
										WC
	Brake shoes	"								WO 400
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS: Suggested material be put in contaminated load bugger.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 400 c/m.

MAXIMUM EXPOSURE RATE: nil.

SIGNED: B. H. Larson
L. C. Carrick

UNCLASSIFIED

J-94-DS (2-54) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 2192 –

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325 D Burial Ground	300-N	SOP	6-6-60	1500 AM PM

DESCRIPTION

Monitor for removal of contaminated zirconium from basement of 325 Bldg. D 300-North.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
		CP GM								WO / WC
	Max reading detected on two enclosed									WO / WC
	metal cans of zir. turnings –									WO 600 / WC
										WO / WC
	Max O/R. D placed cans in									WO / WC
	burial trench –							1	F	WO / WC
										WO / WC
	Survey of personnel and									WO / WC
	vehicle at job completion –									WO <100 / WC
										WO / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 1 mr/hr

MAXIMUM DOSE RATE 1 mr/hr

SIGNED G. Bischoff

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 03628

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325	4-7C DOCK	SPECIAL	9-11-56	0930 AM ~~PM~~

DESCRIPTION

MONITOR FOR UNLOADING OF CONTAMINATED WASTE FROM UW OF SEATTLE (LIQUID C-14 AND DRY Sr^{90}) ALSO FOLLOW-UP OF TRUCK TO 300 AREA BURIAL GROUND FOR BURIAL.

ROUTINE MIN.	SPECIAL	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.
	1 X 140 MIN.		

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	DIRECT SURVEY OF									WO / WC
	LIQUID WASTE CONTAINERS	MICRO WINDOW								WO <100 / WC
2.	SMEARS OF #1	MICRO WINDOW								WO <100 / WC
3.	DIRECT SURVEY									WO / WC
	OF DRY WASTE	TGM								WO 800 / WC
4.	DIRECT SURVEY OF									WO / WC
	DRY WASTE CONTAINER	TGM								WO 300 / WC
5.	SMEARS OF DRY									WO / WC
	WASTE CONTAINERS	TGM								WO <100 / WC
6.	SURVEY OF PERSONNEL	TGM	MICRO-WINDOW							WO <100 / WC

REMARKS:

7. SURVEY OF TRUCK UPON EXIT FROM BG. | TGM | <100

MAXIMUM RADIATION MEASUREMENT OBTAINED: 800 c/m

MAXIMUM DOSE RATE: NONE

SIGNED: R. B. Elledge

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 4335

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
325	6-4-A	SOP	12-19-60	1030 AM ~~PM~~

DESCRIPTION

Monitor for removal of glass vial filled with Uranium Sulphate (?) to be disposed of.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max R/m direct	Poppy MW		<500						WO 4100 / WC
	Max R/m Smears	"		<500						WO <100 / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Informed by lab personel that the hazard was that if air got to the powder, fire was possible. Decon arranged a barrel which was sealed after vial packaged inside. Mark as to the conditions

MAXIMUM RADIATION MEASUREMENT OBTAINED: 4,000c/m

MAXIMUM DOSE RATE N.I

SIGNED C. Brooks

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 4400

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
300-N	Burial Gr.	Special	12-21-60	1430 ~~AM~~ PM

DESCRIPTION

Burial of 3 Boxes Containing 3 Hoods (Glove Boxes) including Misc. Equip.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	(3) Glove Boxes (HEW 430051, 430354,									WO / WC
	437685,									WO / WC
	Balance - HEW 417914									WO / WC
	Balance - HEW 12692									WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

All Items Grossly Contaminated and Corroded.

Buried @ 300-N Burial Ground

MAXIMUM RADIATION MEASUREMENT OBTAINED:

Gross Pu Contam.

MAXIMUM DOSE RATE

SIGNED R C Britton

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54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 4648

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325 A	Rear Face	S.O.P.	1-10-61	08:15 AM

DESCRIPTION

Monitor to transfer Resin from Cells to Waste Cask

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max R/R to transfer									WO / WC
	waste (open valve)	CP				600	6"	50	8"	WO / WC
										WO / WC
	Average R/M on									WO / WC
	outside of transfer									WO / WC
	cave	CP						15	2"	WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

No spread of contamination detected

MAXIMUM RADIATION MEASUREMENT OBTAINED:

600 mrad/hr Inc 50 mr/hr

MAXIMUM DOSE RATE

Same

SIGNED

S. M. Bradbury

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 4776

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
325	6-9-D	SOP	1-16-60	0915-0930 AM ~~PM~~

DESCRIPTION
Monitor H. J. Pierce for removing "hot" waste from Hood behind lead c

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max R/m obtained	CP	(waste carton)			3 RAD	4"			WO / WC
	MAX D/R to body	CP		"		3 RAD	4"			WO / WC
	MAX R/m Slurp Jug	CP				1 RAD	2"			WO / WC
	MAX R/m Mercury Bth.	CP				400	2"			WO / WC
	Hood ledge Smears	GM	(to be cleaned)							WO 600 / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:
Pierce took high rate of exposure due to method used for removing waste. He used no remote equipment. Waste carton read 1 RAD/hr over lead pile but he moved it up on the inside ledge (Brick pile) & put some more waste into it by hand. He was told to keep his head out of the hood.
Personel seemed sceptical of the exposure I told him that he had received. If in the future he

MAXIMUM RADIATION MEASUREMENT OBTAINED:
3 RAD/hr

MAXIMUM DOSE RATE
3 RAD/hr

SIGNED
C. Hooks

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

over

does not want to take my word for this he can furnish his own timekeeper, Also he should advise monitor as to the methods he will use before job starts,

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SURVEY NO. 4922

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325	6-4D	SOP	1-24-61	0800 AM ~~PM~~

DESCRIPTION
Monitor Tracey for removing waste from hood.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	MAX R/m Waste Jug	CP						200	2"	WO / WC
	MAX R/m Merc Bottle	CP						40	2"	WO / WC
	MAX D/R For Job	CP		(waste	Jug	- Hands)		40	2"	WO / WC
	Ave D/R For Job	CP						15	F.	WO / WC
	R/m in Hood After Job	CP				10	F.			WO / WC
	Smears, Ledge, Floor	GM								WO <100 / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS: Personnel informed of conditions

MAXIMUM RADIATION MEASUREMENT OBTAINED: 200 MR/hR

MAXIMUM DOSE RATE 40 MR/hR

SIGNED OD Hooke

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 5036

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325	A	SOP	1-30-61	11 30 AM PM

DESCRIPTION: To set D/R while sampling 2 bottles of resin and moving resin to waste

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1 Man R/M	CP				~~300~~	F	~~300~~		WO ~~WC~~
	2 R/M thru sampling	CP						200	2"	WO WC
	3 Smear sample cart	Hgm								WO <100 WC
	4 Smear area	Hgm								WO <100 WC
	5 Personnel	Hgm								WO <100 WC
	6 D/R to pour out	CP				500	F	—		WO WC
										WO WC
										WO WC
										WO WC
										WO WC

REMARKS: Low R/M bottle of resin poured down sink drain in decon room and pkl. with 6 lead wraps saved for hot waste.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 500 mr/hr

MAXIMUM DOSE RATE 500 mrad/hr.

SIGNED [illegible]

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 5272

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
325	300-N	5DP	2-21-61	0830-0930 AM PM

DESCRIPTION

Monitor for moving Pu glove box for 325 Bldg. to 300-N burial ground

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
Mo	P/M to personnel	CP						5	F	WO / WC
P/M	Truck survey	GM								WO 4100 / WC
P/M	Personnel survey	GM								WO 4100 / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Personnel informed of P/M and conditions. Pu box was not put into waste trench until a crane is available

MAXIMUM RADIATION MEASUREMENT OBTAINED:

MAXIMUM DOSE RATE 5 mr/hr

SIGNED 5 mr/hr J. K. Berry

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 06374

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
327	New Basin	SWP-RSR.	7-10-63	10 00 AM

DESCRIPTION

Monitored during wrapping of coffer dam in plastic & load onto semi-truck for transfer to burial grounds, also removed two "jacks", wrapped and placed on truck for burial.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	~~100~~ MIN.	100 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max dose on coffer dam (bottom gasket).	CP				700	5	200	2"	WO / WC
	Smear prior to wrapping of coffer dam.	CP				60	5			WO / WC
	Max dose on jacks	CP				150	5	30	2"	WO / WC
	Smears on jack.	CP				20	5			WO / WC
	Jacks & coffer dam - wrapped	TCH								WO <100 / WC
	6 pr coveralls	TCH							up	WO 60,000 / WC
	Floor smears near basin	TCH							up	WO 50,000 / WC
	Max d/r to body	CP				30	5			WO / WC
	Max d/r to hand					200	5			

REMARKS:

Coffer dam & jacks were wash with water as they were removed from basin, wrapped in plastic in canyon, and wrapped again in plastic after being loaded on truck to transfer to burial.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

700 mrad/hr @ 5'

MAXIMUM DOSE RATE

200 mrad/hr to Hands

SIGNED J. C. Harmon

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 6481

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
325	Base 1	R/R	5-23-61	10 00 AM ~~PM~~

DESCRIPTION

Survey of two rusty Casks to be buried at 300 North by E. Berreth

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
✓	Survey & Smears									WO
										WC
	of Casks exterior	HGP & PP		<500						WO <100
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

Interior of Casks not known
Lids are banded down, Casks will not open

MAXIMUM RADIATION MEASUREMENT OBTAINED:

MAXIMUM DOSE RATE N/D

SIGNED Schrotke

UNCLASSIFIED

AEC-OT RICHLAND WASH

UNCLASSIFIED

SURVEY NO. 06497

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	F cell	S.O.P.	7-19-63	0810 AM ~~PM~~

DESCRIPTION

Monitor to remove 6 foot chisel from top of F cell

Holms

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
						100	1'			WO
	smear of chisel					5000	4"			WC
	max on chisel after decon					30	2"			WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

cp 216

Chisel bagged - place in bugger.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

5 Rad/hr

MAXIMUM DOSE RATE

100 Mrad/hr

SIGNED

J. D. Cudmore

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 6643

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325 to B. G.			6-6-61	1300 AM PM

DESCRIPTION

Monitor during removal of square cask from 527 to B. G.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	45 MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max T/m obtained	gm CP				< 6	5	< 1	2"	WO < 100
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED:

MAXIMUM DOSE RATE none detected

SIGNED W. L. Vedder

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 7180

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325	528	S.O.P.	7-19-61	1.00 to 3.00 PM

DESCRIPTION

2 Personal surveys and final check of Pu glove box being crated for trip to burial grounds

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	2 personal surveys	gm		<500						WO <100
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

Permission granted to ~~crate~~ glove box. Inform decon to tag box with Rad stickers

MAXIMUM RADIATION MEASUREMENT OBTAINED:

none

MAXIMUM DOSE RATE

none

SIGNED

J. D. Cudmore

UNCLASSIFIED

54-3000-100 (2-57) AEC-GE RICHLAND WASH

UNCLASSIFIED

SURVEY NO. 7226

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325	300-N	SOP	7/24/61	0800-0945 AM PM

DESCRIPTION

Monitor for loading Pu glove box to go to 300-N for disposal. Bof an RSR.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT. REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
R/m	@ box	CP						<1	5	WO / WC
R/m	Box survey direct	Pop		<500						WO / WC
R/m	Truck survey 300-N	GM								WO <100 / WC
R/m	Personnel survey	GM								WO <100 / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Personnel informed of conditions.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

MAXIMUM DOSE RATE N/D

SIGNED <1 mr/hr J. R. Berry

UNCLASSIFIED

AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 7821

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325-Basmt.	CF	SOP	9/12/61	0900 AM PM

DESCRIPTION

Survey of floor area and personnel after vacuum cleaner exploded and burned. Cleaner contained zerk powder.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
MAX	R/m in vacuum cleaner	GM								WO 4,000 / WC
R/m	Floor smears	GM								WO 100 / WC
R/m	Personnel surveys	GM								WO <100 / WC
R/m	Wall smears	GM								WO <100 / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

No real hazard detected. Small amount of contamination detected on floor. All personnel in area at time of fire surveyed. Personnel informed of conditions.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 4,000 c/m

MAXIMUM DOSE RATE N/D

SIGNED J.R. Berry

UNCLASSIFIED

54—3000—190 (2—57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 9216

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
325A		Special	10-13-61	1400 AM PM

DESCRIPTION

To Dispose of Glove Box HEW 437665

To 300 N Burial Ground

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Max R/M at Gloves	CP						450	6"	WO / WC
										WO / WC
2.	Max Smears on Outside									WO / WC
	of Box	HGM								WO <100 / WC
										WO / WC
3.	Max D/R to Personnel	CP						450	6"	WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Glove Box is placed in Plastic bag and then in Plywood Box.

Radiation Labels attached to box

PDR requested signed by T C Mehas

MAXIMUM RADIATION MEASUREMENT OBTAINED: 450 mr/hr.

MAXIMUM DOSE RATE 450 mr/hr

SIGNED R C Fowler

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 8311

RADIATION SURVEY

BUILDING NO.	ROOM NO.	~~S.W.P.~~ NUMBER	DATE	TIME OF SURVEY
325 A	603	50p	10-20-61	1130 AM PM

DESCRIPTION

Monitored for HLRF personnel to crate Sr glove hood. for burial.

ROUTINE	SPECIAL	SWP INTERMITTENT	~~SWP~~ CONTINUOUS
MIN.	MIN.	MIN.	50p 30 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ Max. reading at surface of glove hood.	cp				500	S			WO WC
	2/ Max. D/Rate to hands	cp				500	S			WO WC
	3/ Max. D/Rate to body	cp				500	S			WO WC
	4/ Survey of personnel	HGM								WO <100 WC

REMARKS:

Personnel informed of conditions

MAXIMUM RADIATION MEASUREMENT OBTAINED: 500 mrad/hr

MAXIMUM DOSE RATE 500 mrad/hr

SIGNED W. O. Leonard

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 8714

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325	520	Special	11-22-61	1300 ~~AM~~ PM

DESCRIPTION

Survey of Lucite Hood To be Discarded @ Burial Ground.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Lucite Hood	CP				20	F.	—		WO / WC
	HEW-445875	Pappy		24,000						WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Gross Contamination on Interior of Lucite Box.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

20,000 D/m 20 mrads/hr @ F

MAXIMUM DOSE RATE

Nil

SIGNED R C Buttles

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 009360

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325	4300 North	SOP	1-16-62	10 00 AM ~~PM~~

DESCRIPTION

Monitor transportation to haul Pu dust from 325 Bldg. to 300 North on RSR

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1	Survey of outside									WO
										WC
	of Surface of ducts	SPP		<500						WO
										WC
2	Survey of truck									WO
										WC
	bed & tires	HCM		<500						WO < 100
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

Shipped on RSR

MAXIMUM RADIATION MEASUREMENT OBTAINED: N/D

MAXIMUM DOSE RATE

SIGNED Schroetke

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 009363

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325	524A	Special	1-16-62	1300 ~~AM~~ PM

DESCRIPTION

Survey Vacuum Cleaner HEW 453520
To be Discarded in Contam. Waste

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Vacuum Cleaner									WO / WC
	HEW 453520	CP				~~100~~		100	2"	WO / WC
										WO / WC
	Gross PU and Beta-Gamma Contam									WO / WC
	External and Internal									WO / WC
										WO / WC
	Bolt Cutters 24"	P Gmo		2,000						WO 2,000 / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Not Recommended For Re-Use

Bolt Cutters ~~to~~ Could not be Decontaminated.

Copy To: Miner Construction.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 100 mr/hr @ 2"

MAXIMUM DOSE RATE: N.I

SIGNED: R C Butters

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY ~~NO.~~ 9445

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
325	520-400	S.O.P.	1-25-62	1130 AM ~~PM~~

DESCRIPTION

Survey of boxed items for disposal.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
		CP-3 gm								WO <100
	RM thru side of "mini" mixer settler HEW445870									WC
										WO
"	" " " displacement apparatus HEW401575									WC <100
										WO
"	" " " Roller Smith Balance HEW417715							2	2"	WC
										WO
										WC
										WO
										WC
	Smears of exterior surfaces of above.	SPP gm		<500						WO <100
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

All above items removed grossly Pu contaminated cells or glove boxes.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 2 mr/hr

MAXIMUM DOSE RATE <1

SIGNED C. A. Fronlaende

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 010783

RADIATION SURVEY

BLDG NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
525	—	Special	6-15-62	10 Je AM

DESCRIPTION

Survey Material For Disposal Because of Pu and Beta-Gamma Contamination

TIME	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad/hr	DIST.	mr/hr	DIST.	c/m AT 1"
Stainless Steel Sink	Lu		6,000						WO 10,000
									WC
Duct Work (2)	Lu		9,000						WO 1,000
									WC
Glove Boxes (2)	Lu		Gross						WO 20,000
									WC
									WO
									WC
									WO
									WC
									WO
									WC
									WO
									WC
									WO
									WC
									WO
									WC
									WO
									WC
									WO
									WC

REMARKS:

Copy with P.D.R.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 20,000 (Lu) - Gross Pu in Glove Boxes

MAXIMUM DOSE RATE Nil

SIGNED R. L. Button

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 12347

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
325			1-7-63	1300 AM PM

DESCRIPTION

Monitor for Removal of Oil Barrels to Burial Ground.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	C/m AT 1"
1.	Max R/M on Barrels	HGM								WO 5,000
										WC
										WO
										WC
2.	Max Smears on									WO
	Outside of Plastic	HGM								WC
										WO <200
										WC
3.	Max R/M on Truck									WO
	After Dumping Barrels	HGM								WC
										WO <200
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

Barrels were loaded in open Lugger and removed to Burial Ground

Personnel informed of Conditions.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 5,000 c/m

MAXIMUM DOSE RATE 5,000 c/m

SIGNED R C Johnson

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 51856

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3741	To R.G.		12-7-55	10:00 AM PM

DESCRIPTION: Monitor sealing up waste carton of aluminum cuttings and hauling to 300N Burial Ground and release personnel and equipment after job complete

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	90 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Waste Carton Reading	CP						1r	1'	WO / WC
	Waste Carton	CP						500	2'	WO / WC
	Waste Carton	CP						200	3'	WO / WC
	Waste Carton	CP						4r	4"	WO / WC
2.	Edge of Truck bed	CP						600	F	WO / WC
	3' from edge of Truck bed	CP						200	F	WO / WC
3.	Cab of truck while									WO / WC
	hauling waste	CP						100	F	WO / WC
4.	At Top of R.G. Trench	CP						100	F	WO / WC
5.	Personnel + Equipment	Tgm								WO <100 / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 4 r/hr

MAXIMUM EXPOSURE RATE: 1 r/hr

SIGNED: [illegible]

UNCLASSIFIED

J-94-DS (2-54) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 51924

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3741	Hatshop	—	1-17-55	12:30 AM PM

DESCRIPTION

Monitering removal of Bricks (lead.) waste from Hatshop—

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	4 hours — MIN.

~~NOT~~ REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
✓	Max dose rate on Bucket of samples	cp						3R	6"	WO WC WO WC WO WC WO WC
✓	Max Dose rate on waste boxes to be taken to burial garden	cp						2R	5	WO WC WO WC WO WC WO WC
✓	Max on Background	cp						15	f	WO WC

REMARKS:

✓ General average cp while working — 30 f

✓ All personnel checked H.E.W. < 500 D.M

recommended that radiation zone be setup
" that British leggins be worn
" that gloves be taped to suspe clothing
" that leather gloves be changed.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 3R/h

MAXIMUM DOSE RATE 2R/h

SIGNED L. L. McDaniel

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

51931

UNCLASSIFIED

SURVEY NO. 51931

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3741	Hot shop	ex/326 6-123	1-20-55	8:00 AM PM

DESCRIPTION

Monitoring the removal of milling machine and lathe to burial grounds

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS 4 hours MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max dose on lathe	~~#~~ Cp						<1		WO
										WC
										WO
										WC
	Max dose rate on	Cp						<1		WO
										WC
	Milling Machine									WO
										WC
										WO
										WC
	All personnell checked	~~#~~ Hi Cp		<500						WO 400
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED:

MAXIMUM DOSE RATE Insignificant Insignificant

SIGNED [illegible]

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 51432

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY AM PM

DESCRIPTION

3741 Hot shop — 1-20-55 10:00

Survey of Lathe to be sent

~~Sen~~ to burial ground — also Milling

Machine and cut off wheel.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
										WO / WC
										WO / WC
	Max contamination	Mica		50,000	Beta			21		WO / WC
	on Lathe									WO / WC
	Max contamination									WO / WC
	Cut off wheel	Mica		30,000	Beta			1.		WO / WC
										WO / WC
	Max Contamination									WO / WC
	on Milling machine	Mica		30,000	Beta			1.		WO / WC
										WO / WC

REMARKS:

these items were released for Burial.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

MAXIMUM DOSE RATE	SIGNED
50000 D/M	

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

21 mr

End Jan Report

UNCLASSIFIED

SURVEY NO. 51933

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3741	Hotshop	ext 3266-	1-20-55	11:00 AM PM

DESCRIPTION

Survey of telephone for burial - telephone 3857.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	30 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Smear of telephone	Mean Jam		500						WO 400
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 500 D/M

MAXIMUM DOSE RATE Insignificant

SIGNED [illegible]

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 52264

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
326	12-A	Special	8-7-56	0900 AM ~~PM~~

DESCRIPTION

Survey of plant made oven to be buried in 300-N burial ground.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	2-X 15 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Oven #HEW-445198	TGM								WO ~~4000~~
	Inside									WC
										WO
										WC
2.	Smears	TGM								WO 300
	Inside.									WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

~~No contamin~~

To be wrapped or otherwise contained before removal from bldg.

Copy to M.P. Jones.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 4000 c/m

MAXIMUM DOSE RATE

SIGNED J. L. Mufield
Harry Martin

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 59150

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	300-N	C.O. 319 ext.	6/16/59	1030 AM

DESCRIPTION

Monitor Personnel to haul misc. Junk to 300 N Burial Ground

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ 15- Blowers	—								WO — / WC
										WO / WC
	2/ Several large rolls on elec wire from 327 to 303									WO — / WC
										WO / WC
	4/ elec. conduit & misc. Junk	—								WO — / WC
										WO / WC
	5/ Release Survey of Personnel + truck	GM								WO <100 / WC
										WO <100 / WC
										WO / WC
	6/ max. R/m	CP	Burial			100 F Ground				WO / WC

REMARKS:

Item #1 these Blowers were removed from 3706 and marked with Radiation-tape, open ends covered with Plastic - No Survey necessary!

Low Level contamination possible on Junk around 327 not Surveyed

MAXIMUM RADIATION MEASUREMENT OBTAINED: 100 mrad/hr

MAXIMUM DOSE RATE < 6 mrad/hr

SIGNED F H Bunigg

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 60906

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. R. NUMBER	DATE	TIME OF SURVEY
327	Canyon	Ext	7-22-54	AM PM

DESCRIPTION: Removal of waste from Cut off Box

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NDT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm PU	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max Exposure									WO / WC
	Sealing Box	CP				600	4'	100	4'	WO / WC
	Exposure on fork lift	CP				300	6'	70	6'	WO / WC
	Max Dosage on Box	CP	off scale			β	2"	4R	4"	WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: off scale β including 4R/hr

MAXIMUM EXPOSURE RATE: 600 mrads/hr

SIGNED: L. G. Campbell

UNCLASSIFIED

J-94-DS (2-54) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 61196

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	canyon	T-Mat-3	1-17-54	0830 AM PM

DESCRIPTION

Remove loose U. Sil. compound from Furnace tube to ice-cream carton (sealed).

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	30 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	outside of furnace tube	CP						20	2"	WO / WC
2.	compound in carton	"				~~1.5~~	5	30	2"	WO / WC
3.	Tube after being emptied	CP						6	2"	WO / WC
2(a)	Compound in carton	"				<6	2'	<6	2'	WO / WC

REMARKS:

Carton of waste compound ~~discarded~~ Placed for Dry Contaminated waste.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 1.5 Rad/hr

MAXIMUM EXPOSURE RATE: <6 mr/hr

SIGNED C. G. Spring

UNCLASSIFIED

J-94-DS (2-54) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 61334

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
327	Canyon	T-Met-3	1-27-55	1100 AM PM

DESCRIPTION

Transfer broken lengths of graphite blocks from basin to contaminated white cartons.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	40 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Collection of graphite									WO / WC
	frees in cartons	CP				200	2	15	2'	WO / WC
2.*	" "	CP				300 ~~250~~	S	50	2"	WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

* Readings taken at surface of box containing samples.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 300 mrad/hr

MAXIMUM EXPOSURE RATE: 200 mrad/hr

SIGNED C. G. Spring

UNCLASSIFIED

J-94-DS (2-54) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 80704

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3706		Ext.	11-8-54	1330-1445 AM PM

DESCRIPTION

Contamination survey of sinks removed to 300-N burial ground.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max. reading at edge of pit	CP				340	F	40	F	WO / WC
	Max. exposure to driver	CP						3	F	WO / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 340 Mrads/hr.

MAXIMUM EXPOSURE RATE: 3 mr./hr

SIGNED R. L. Miles

UNCLASSIFIED

J-94-DS (2-54) AEC-CE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 80797

RADIATION SURVEY.

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3706	~~Bldg~~ 1PA-21	300-NC-52-	12-9-54-	0700-1600 AM PM

DESCRIPTION

Cobble. Giner Construction removes materials and equipment from Rooms 1PA-21 and hauls to Burial Ground.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS 8 hrs. ~~MIN.~~

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. c/m	μgm PU	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Hoods & Benches	Poppy		5,000						WO
										WC
	~~Hoods~~ & Benches	TGM								WO 20,000
										WC
2.	Misc. pieces & piping	Poppy	10,000							WO
										WC
	Misc. pieces & piping	TGM								WO 3,000
										WC
3.	Personnel	Poppy		<500						WO
										WC
	Personnel	TGM								WO <100
										WC
	Personnel	Nico Wonder		<500						WO <100
										WC
4.	1st Trip To B.G.	TGM CP						70	F	WO
										WC
	* 2nd Trip To B.G.	TGM CP						70	F	WO
										WC
										WO
										WC

REMARKS:

See Surveys No. 40218 & 40219. This work is the removal of these things surveyed.

* 2nd Trip to Burial Ground - the truck bed had been covered with a large piece of sisal craft stapled to truck. The paper was blown off shortly after start. Recovered without incident.

MAXIMUM RADIATION MEASUREMENT OBTAINED:
70 MR/hr 3000 c/m 20,000 c/m

MAXIMUM EXPOSURE RATE:
70 MR/hr. None Detectable

SIGNED [illegible]

UNCLASSIFIED

J-94-DS (2-54) HEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 80301

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3706	#17, 19 & 21	300-HP-75	3-27-55	2:00 ~~AM~~ PM

DESCRIPTION

Monitored transfer of second & third loads of contaminated wall panels & electrical fixtures to 300 North burial gardens from 3706 bldg.

ROUTINE MIN. | SPECIAL MIN. | SWP INTERMITTENT MIN. | SWP CONTINUOUS 130 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max dosage on waste	CP				<6	5			WO / WC
										WO / WC
	Max dose rate in cab	CP				<1	F			WO / WC
										WO / WC
	Max dose rate to body in burial gardens.	CP						15	F	WO / WC
										WO / WC
	Survey of driver & laborer	TGH								WO <100 / WC
	Survey of tires & cab	TGH								WO <100 / WC
										WO / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED:
15 mr/hr @ Field

MAXIMUM EXPOSURE RATE:
15 mr/hr @ Field

SIGNED V. Harmon
H. H. Ehmsen

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 90366

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	Burial Garden		16/7V	1550 AM PM

DESCRIPTION

Trip to 2V burial garden from 327 Bldg.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
60 MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max Reading on West Bt	TP						150 R/h	5	WO / WC
	" " " "	"						75 R/h	4"	WO / WC
	Exposure Rate to Footing	Juno						1 R/h	8'	WO / WC
	Exposure rate to Drivers	"						350	F	WO / WC
(A)	" " at Burial Gard	"						500	F	WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

(A) Edge of Pit.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 150 R/hr

MAXIMUM EXPOSURE RATE: 1 R/hr

SIGNED F. L. Wenter

UNCLASSIFIED

J-94-DS (2-54) AEC-GE, RICHLAND WASH

UNCLASSIFIED

SURVEY NO. 91293

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
3706	300 North	Burial	5-11-55	1.00 AM PM

DESCRIPTION

Special Survey of Lathe that was buried in 300 North burial Gardens.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	120 MIN.

NOT REQ.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Max at edge pit	cp.				50	10'	50	18	WO / WC
2.	Max to man as he was pulled up to edge of pit	cp				600	2'	100	2'	WO / WC
3.	survey of gloves and coveralls	tgm cp	4							WO 10,000 / WC
4.	Personal check of three man.	tgm								WO 100 / WC

REMARKS:

Moto crane lifted hot lathes up over pit where the were cut loose.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 100 mrads/h

MAXIMUM EXPOSURE RATE: 600 mrads/h

SIGNED [illegible]

UNCLASSIFIED

J-94-OB (2-54) HEDGE, HIGHLAND, WASH

UNCLASSIFIED

SURVEY NO. 91825

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327 & B G			5-1-56	930 AM ~~PM~~

DESCRIPTION

Monitor Burial of Uranium Cylinder

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	45 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max. D.R. on Cylinder	C-P	-					50		WO / WC
	D.R. @ trench							25		WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Cylinder was lowered into trench without incident.
2 trucks, Crane, & Personnel - < 100 c/m B-G.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 50 mr/hr.

MAXIMUM DOSE RATE 25 mr/hr.

SIGNED R. W. Simmons

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

RADIATION SURVEY

11046

546		RSR	3 30 59	1315

Group of tools for removal of [illegible] fuel

NO.		INST.	AREA	MAX.						
1.	2 tools of [illegible]	1(m)								2000
2.	Set of pickup	"								200

Pickup limit is 2000/m. Tools issued with test of bottom of limits

4000/m

[illegible]

UNCLASSIFIED

SURVEY NO. 110320

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
306	OUTSIDE	SPECIAL	10-15-57	1300 AM PM

DESCRIPTION: SPECIAL SURVEY OF CENTERLESS GRINDER FOR FUTURE BURIAL.

ROUTINE MIN. | SPECIAL 1 X 30 MIN. | SWP INTERMITTENT MIN. | SWP CONTINUOUS MIN.

ITEM NO.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	1-7 Pu	mrad/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1	MAX FOUND NEAR									WO WC
	GRINDING WHEEL	SPP		40,000						WO WC
2	SEE BELOW									WO WC
										WO WC
										WO WC
										WO WC
										WO WC
										WO WC
										WO WC
										WO WC

REMARKS:

#1 GRINDER IS GROSSLY CONTAMINATED, VERY SMEARABLE - WAS THE ONLY PORTION OF GRINDER ACCESSIBLE TO MONITORING BECAUSE OF WRAPPING. THIS GRINDER WAS SURVEYED BEFORE WRAPPING AND FOUND TO BE GREATER THAN 100,000 d/m, BY ANOTHER MONITOR.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

MAXIMUM DOSE RATE 40,000 d/m

SIGNED K. B. [illegible]

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 200289

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
329	1-A	S.O.P.	9-3-54	0930 AM PM

DESCRIPTION

Monitor during removal of Ru. 106 waste to contaminated load lugger.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	30 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrep/hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max. dosage rate obtained from cartons.	Jumo				460	5	10	2"	WO / WC
	Max. exp. rate to carry.	Jumo				460	5	10	2"	WO / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 460 mrads/hr. incl. 10 mr/hr.

MAXIMUM EXPOSURE RATE: 460 mrads/hr. incl. 10 mr/hr.

SIGNED Wilf Vedder

UNCLASSIFIED

R-94-DS (11-51) A.E.C. - G.E. - RICHLAND, WASH.

UNCLASSIFIED

SURVEY NO. 200348

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
329	11B		10-5-54	03:00 AM (PM)

DESCRIPTION

SPECIAL SURVEY OF ROOM & EQUIP.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	30 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1	LEAD PENCIL	TGM								WO 25,000
										WC
										WO
										WC
2	ONE LEAD BRICK	TGM								WO >80,000
										WC
										WO
										WC
3	WASTE BOX	TGM								WO >80,000
										WC
										WO
										WC
4	MICROSCOPE STAGE	TGM								WO 800
										WC
										WO
										WC
5	SPOT CHECK FLOOR									WO
										WC
	& WORK BENCHS	TGM								WO <100
										WC

REMARKS:

SUGGESTED THAT CONTAMINATED WASTE BOX BE DISCARDED IN CONTAMINATED WASTE LUGGER

DISCARDED PENCIL IN CONTAMINATED WASTE

MAXIMUM RADIATION MEASUREMENT OBTAINED:

≥ 80,000

MAXIMUM EXPOSURE RATE:

SIGNED

John C. Ballinke

UNCLASSIFIED

J-94-DS (2-54) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 2014472

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
300 N	Burial Ground	3-003	3-18-57	0930 AM ~~PM~~

DESCRIPTION

Monitoring While Personnel Dumps Lathes In 300 N. Burial Pit

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	150 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1 Max. Rd. Level @ Pit	RP						30	F	WO / WC
	2 Max. D/R While Setting Down Lathes	RP						10	F	WO / WC
	3 Avg. D/R While Setting Down Lathes	RP						5	F	WO / WC
	4 Max. Rd. Of Lathes	RP						<5	Field	WO / WC
	5 HO-6BE 2947-5412	TGM								WO <100 / WC
	6 HO-17T-5695	TGM								WO <100 / WC
	7 HO-17T-5696	TGM								WO <100 / WC
	8 10 cu - Personnel Surveys	TGM								WO <100 / WC

REMARKS:

4 - Lathes Were Placed On Timbers At Edge of Pit -- Will Be Pushed Over This Afternoon At Pit

5 - Released

6 - Released

7 - Released

8 - Released

No Spread of Contamination Detected

MAXIMUM RADIATION MEASUREMENT OBTAINED:

30 mr/hr

MAXIMUM DOSE RATE

10 mr/hr To Body

SIGNED

G. A. Whatt

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 310466

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
326		R. D. R.	2-21-58	8 20 AM PM

DESCRIPTION

Survey of Contam. glove box to be buried on R.D.R. (Radiation Disposal Record)

ROUTINE MIN.	SPECIAL 60 MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max. ind. thru side of box	TGM								WO 300
										WC
	Smears of box	TGM SSP		<500						WO <100
										WC
	Direct survey of box	SSP		<500						WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

All cracks and openings of box were taped shut and R. M. suggested cardboard to be placed over window in case of breakage. Rad. level inside box unknown due to taped cond.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 300 c/m

MAXIMUM DOSE RATE

SIGNED R. Schrotke

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE RICHLAND WASH

UNCLASSIFIED

SURVEY NO. 310480

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
326	248	50P	3-5-58	3:00 ~~AM~~ PM

DESCRIPTION

Monitor R. & D. to bury waste from 24-B and 3730

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	45 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max. ind. from thermo-couple wires	CP						1R	4"	WO / WC
	Max. DR to carry at length	"						200	18"	WO / WC
	Max. ind. from bottle of graphite dust	"						800	3"	WO / WC
	DR to carry	"						100	18"	WO / WC

REMARKS:

Trash was disposed of at 300 North burial ground.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 1 R/hr

MAXIMUM DOSE RATE 200 mr/hr

SIGNED Schrotke

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AEC-GE RICHLAND WASH

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SURVEY NO. 310557

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
326	47-B		7-9-58	1 00 ~~AM~~ PM

DESCRIPTION

Survey of contaminated furnace for release for disposal

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	10 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1	Gen. Survey of									WO
										WC
	furnace	H6M								WO 200
										WC
2	interior of furnace									WO 600
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 600 c/m

MAXIMUM DOSE RATE

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RADIATION SURVEY

SURVEY NO. 320127

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
326	24A	Special	3-28-58	2:00 ~~AM~~ PM

DESCRIPTION

Survey of one Tank and three boxes of tubing for release for disposal

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	25 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	direct and smears									WO
										WC
	of outside of Tank	HGM SPP		<500						WO <100
										WC
										WO
										WC
	Max. ind. from									WO
										WC
	three boxes of tubes	"		<500						WO 800
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

Material to be buried as tank was enclosed and tubes had been used to cast Uranium.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 800 c/m

MAXIMUM DOSE RATE

SIGNED [illegible]

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54-3000-190 (2-, ...) AEC-GE, RICHLAND, WASH

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RADIATION SURVEY

SURVEY NO. 320160

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
326	13A		6-16-58	10 AM ~~PM~~

DESCRIPTION

Monitor shippment of Co^{60} sources to 325 Bldg for burial

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	40 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1	Max. ind. from one flask	TP						200+	2"	WO / WC
2	Max DR to remove flask	"						4+	hands	WO / WC
3.	Ave DR on other flasks	CP						200	2"	WO / WC
4	smears of casks	HEM								WO ~ 100 / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Casks released to 325 Bldg. R.M.O. notified

4 r/hr reading was OK'ed by R.L. Watters.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 200 r/hr

MAXIMUM DOSE RATE: 4 r/hr

SIGNED: Schuette

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AEC-GE RICHLAND WASH

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SURVEY NO. 390041

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
326 To	Burial Ground	R-5R.	4-7-58	1330 AM PM

DESCRIPTION

Survey of Tank Type Cask For-
Burial.
Check Personnel + Vehicle out of Burial Ground

ROUTINE MIN. | SPECIAL MIN. | SWP INTERMITTENT MIN. | SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Outside CASK	Gm								WO <100
										WC
	Smear	Gm								WO <100
										WC
2.	Inside Small									WO
										WC
	Opening where									WO
										WC
	Sample Port and									WO
										WC
	Samples go	Not checked				Opening		to	Smear	WO
4.	Personnel	Gm								WO <100
										WC
5.	Vehicle	Gm								WO <100
										WC
										WO
										WC
										WO
										WC

REMARKS:

Unable to Check inside CASK so
Cannot Release For Excess.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

MAXIMUM DOSE RATE None Detected

SIGNED R.A. Massey

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

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SURVEY NO. 400185-A

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3706	21 + 57	—	4-2-54	9:15 AM

DESCRIPTION

Two glove boxes, HEW 429648 + 437715 (one box) and HEW 409976 were surveyed prior to disposal in 300 Area Technical burial ground.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	40. MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrep/hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Glove box 437715 429648	poppy								WO / WC
	exterior surfaces	"		20 000						WO / WC
	after sealing	"		<500						WO / WC
	interior estimate →				~50000					WO / WC
										WO / WC
	Glove box 409976	poppy								WO / WC
	exterior surfaces	"		1000						WO / WC
	after sealing	"		<500						WO / WC
	interior estimate →				10 000 50 000					WO / WC
										WO / WC

REMARKS:

Decontamination of interiors of glove boxes would not be feasible.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 20 000 d/m

MAXIMUM EXPOSURE RATE: —

SIGNED W A Snyder.

2 Copies to J C. Classey.

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SURVEY NO. 400195

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
300 NORTH BURIAL GROUND		5-001	5-10-54	1330 AM PM

DESCRIPTION

SPECIAL SURVEY OF THREE GLOVE BOXES FROM RM'S 21, 95, 53 IN BLDG 3706 TAKEN TO 300 NORTH BURIAL GROUND

ROUTINE MIN. | SPECIAL 180 MIN. | SWP INTERMITTENT MIN. | SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
	GLOVE BOXES (3)	POPPY		<500						WO / WC
	EAST EDGE OF PIT	CP				all γ		20	15'	WO / WC
	SOUTH END OF PIT	"				all γ		20	15'	WO / WC
	WEST SIDE OF PIT	"				all γ		60	F	WO / WC
	1 PR. GLOVES	POPPY		1000						WO / WC
	PAPER FROM TRUCK BED	POPPY		~500						WO / WC
	truck bed	POPPY		<500						WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Gloves and paper from truck bed thrown into pit.
Truck bed & workers released

MAXIMUM RADIATION MEASUREMENT OBTAINED: 1000 D/m & 60 MR/hr

MAXIMUM EXPOSURE RATE: 60 MR/hr

SIGNED W. Flory & [illegible]

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J—94—DS (2—54) AEC-GE, RICHLAND, WASH

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SURVEY NO. 400301

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
300 N burial ground			6-23-54	1000 AM PM

DESCRIPTION

Monitor pulling of bucket containing cut-off box (sludge box) into burial trench by using ropes. (Bucket was filled with concrete.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	✓ 10 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrep/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1-	~3' From bucket	cp				all γ		3000	3'	WO / WC
										WO / WC
2-	~8' From bucket	cp				all γ		400	8'	WO / WC
										WO / WC
3-	Av. Exposure rate doing job	cp				all γ		80	F	WO / WC
										WO / WC
4-	MAX exposure rate doing job	cp				all γ		3000	3'	WO / WC
										WO / WC
										WO / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED:
3000 mr/hr

MAXIMUM EXPOSURE RATE:
3000 mr/hr

SIGNED [illegible]

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R-94-DS (11-51) A.E.C.-G.E.-RICHLAND, WASH.

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RADIATION SURVEY

SURVEY NO. ~~[illegible]~~ 410108

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	CANYON	T-MET-3	1-5-57	2200 ~~AM~~ PM

DESCRIPTION

MONITOR FOR PERSONNEL TO REMOVE HOT WASTE FROM "E" CELL INTO WASTE CASK (OBLONG ONE) FOR FUTURE REMOVAL TO BURIAL GARDEN.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	1 X 30 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	MAX DOSAGE RATE THRU SIDE OF CASK	CP				ALL γ		3.5 m	2"	WO / WC / WO / WC
2.	MAX DOSE RATE TO PERSONNEL LOADING CASK.	CP				ALL γ		1 m	12"	WO / WC / WO / WC
3.	MAX DOSE RATE TO PERSONNEL MOVING CASK LENGTH OF CANYON.	CP				ALL γ		50	5'	WO / WC / WO / WC
4.	MAX DOSE RATE FROM CASK AT NEAREST APPROACH	CP				ALL γ		10	15'	WO / WC / WO / WC

REMARKS AFTER STORING HOT WASTE WAS PANNED BEFORE BEING PLACED IN CASK - HOT - WASTE CONSISTED OF "NAK" MATERIAL FROM ACC. AREA OF LOADING CASK WAS PAPERED NO MATERIAL WAS PASSED THRU OPEN AIR. NO SPREAD OF CONTAMINATION NOTED - CASK WAS NON-SMEARABLE.

MAXIMUM RADIATION MEASUREMENT OBTAINED: ALL γ 3.5 m/h

MAXIMUM DOSE RATE ALL γ 1 m/h

SIGNED R. B. [illegible]

UNCLASSIFIED

SURVEY NO. 411131

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
327	CANYON	T-MET-8	4-25-57	1510 ~~AM~~ PM

DESCRIPTION

MONITOR FOR REMOVAL FROM CANYON TO BURIAL GROUND OF STEEL CAVE.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	45 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	MAX. SMEARS									WO
										WC
	ON OUTSIDE OF									WO
										WC
	CAVE	TGM								WO 800
										WC
2.	MAX. INSIDE OF									WO
										WC
	CAVE AS RECORDED									WO
										WC
	ON TAG ON END									WO
										WC
	OF CAVE	TGM								WO 5000 c/m
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

CAVE WAS SEALED WITH RADIATION TAPE AND WILL BE TAKEN TO THE BURIAL GROUND RMO FROM 3706 Bldg. ESCORTED LOAD TO BURIAL GROUND.

ALL PERSONNEL INFORMED OF READINGS

MAXIMUM RADIATION MEASUREMENT OBTAINED: 800 c/m

MAXIMUM DOSE RATE: NONE DETECTED

SIGNED: [illegible]

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SURVEY NO. 411822

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	Canyon	327-2	6-10-59	1645 AM PM

DESCRIPTION

Survey of Discarding Dissolver Solution into Waste Boxes.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	30 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Dissolver Solution	CP.				1.3 RAD	2"	150	4"	WO / WC
										WO / WC
2.	Waste Box After									WO / WC
	Solutions Placed									WO / WC
	there and Sealed	CP.						500	2"	WO / WC
3.	max dr to body									WO / WC
	Sealing Box	CP.						100	30"	WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 1.3 Rad/hr 150 mr/hr

MAXIMUM DOSE RATE 100 mr/hr body

SIGNED R. F. Marsagh

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54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

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SURVEY NO. 412207

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	Basement		7-21-59	9:00 AM PM

DESCRIPTION

Survey of equipment to go for disposal.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	HEW #(_ 3963 pump	tgm		Unknown amounts of contamination inside.						WO / WC
2.	HEW 401373 pump	tgm		Unknown amounts of contamination						WO / WC
				on the inside of pump.						WO / WC
3.	HeW 434594 Pump	tgm		Unknown amounts of contamination on						WO / WC
4.	HEW445120 Pump	tgm		the inside of pump. Unknow amounts of contamination on the						WO / WC
5.	HEW423695 Die table	tgm		inside of pump. General						WO 2000 / WC
6.	HEW 437733 glove box	tgm								WO 10000 / WC
7.	HEW 437734 Glove box	tgm								WO 1000 / WC
8.	HeW 429361 Hood.	tgm								WO 2000 / WC
9.	Hew 429395 Molding machine	tgm			General					WO 3000 / WC

REMARKS:

10. HEW 418817 Milling machine tgm 2000c/m

These items are not released to go off plant.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 3000c/m

MAXIMUM DOSE RATE

SIGNED L. L. Mc Intire.

UNCLASSIFIED

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SURVEY NO. 412273

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
327	Decon	327-2	8.29.57	2100 AM PM

DESCRIPTION

Kelly and Atwood to work on waste from Jr. Cave. (Waste includes chips broken from U sample)

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ Max R/M at bottom of beaker	CP				~~2~~		~~1~~ 5r	8"	WO / WC / WO / WC
	2/ Max D/R	CP				2rad	F	1r	F	WO / WC
	3/ Av. D/R at Decon Hood	CP				300	F	200	F	WO / WC
	4/ Max R/M on Waste Carton in Decon Cell	CP				2rad	1"	1r	3"	WO / WC
	5/ D/R towards the waste	CP				300	F 15"	200	F 17"	WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Kelly drained off dissolved alum except for some sludge which contained the missing U. The beaker and all put into waste and then fire possibility considered and beaker put in Decon sink and filled with 80% Nitric and left overnight. Assault Masks worn ≈ Air = 6.0×10^{-9}

MAXIMUM RADIATION MEASUREMENT OBTAINED: ~~2 rad/hr~~ .5 r/hr

MAXIMUM DOSE RATE 2 rad/hr inc 1 r/hr

SIGNED [illegible]

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SURVEY NO. 412680

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	Basement	327-2	9-3-59	0845 AM ~~PM~~

DESCRIPTION

Monitor Charlie Ogston to Remove "Hot Waste" & Glove Box From Basement to Lugger-

ROUTINE MIN. | SPECIAL MIN. | SWP INTERMITTENT MIN. | SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ max R/m	+PCP				5 rad	1"			WO WC
	2/ max. D/R	CP		B-Filter				300	2'	WO WC
	3/ max. D/R					waste 300	18"	to Body		WO WC
	4/ max. D/R		to BOX waste			1.5 rad	S	FLASH	~~to~~ hand	WO WC
	5/ max. R/m		Basement			300	2'	FLOOR		WO WC
	6/ max. ave. D/R		to haul			10	F	waste		WO WC
										WO WC
	Lugger Full - Waste Left									WO WC
	on cart & Roped off in Wast									WO WC
	end of canyon -									WO WC

REMARKS: Personnel informed of D/R -

Waste carton placed in glove box to be discarded with Hot side shielded by glove box. D/R reduced in this manner. entire package wrapped in clean kraft paper before removal to canyon from Basement - No spread of contam. detected

MAXIMUM RADIATION MEASUREMENT OBTAINED: 5 rad/hr

MAXIMUM DOSE RATE 1.5 rad/hr

SIGNED F H Briggs

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54-3000-190 (2-57) AEC-GE, RICHLAND WASH

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SURVEY NO. 412761

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
327	canyon	327-3	10-9-57	1000 AM PM

DESCRIPTION: To set D/R and take max R/M of sample mount press as it is moved from Decon Cell to Waste Load Lugger. (Origin from C Cell)

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ Max R/M	CP				1600	1"			WO / WC
	2/ D/R to hands	CP				400	F 18"			WO / WC
	3/ D/R to drive fork lift	CP				20	F			WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS: Press dropped in Load Lugger from fork lift.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 1600 mrads/hr.

MAXIMUM DOSE RATE: 400 mrads/hr

SIGNED: [illegible]

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SURVEY NO. 412672

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
324	CANYON	324-2	12-14-54	0845 AM PM

DESCRIPTION

Survey of Removal of Al. Tubing From basin to Dry waste Box And Removed to Load hugger.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	MAX Reading on Al. Tubing observed	C.P.				8.6 RAD	1"	100	3"	WO / WC
2.	MAX d/R to body TAPeing box	C.P.						30	24"	WO / WC
3.	Floor SMEAR basin	GM								WO 3000 / WC

REMARKS:

Waste box Lined with plastic liner because Al. Tubing wet when Removed From basin.
12' Tongs used to Remove Tubing.
Floor cleaned.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 8.6 RAD/hr-100 mr/hr

MAXIMUM DOSE RATE 30 mr/hr body

SIGNED R. A. Massey

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J-94— DS (2-55) AEC-GE, RICHLAND, WASH

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SURVEY NO. 502361

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
321		SOP	11-4-59	14 45 ~~AM~~ PM

DESCRIPTION

Contamination Survey of items for disposal

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Electric Vibrator	GM								WO 400 / WC
	HEW 404741									WO / WC
	Electric Vibrator	GM								WO 40,000 / WC
	HEW 444380									WO / WC
	Manometer	GM								WO 800 / WC
	HEW 444345									WO / WC
	Electric Motor	GM								WO 8000 / WC
	Serial # 7361									WO / WC
	Model # 6367									WO / WC
	Six Hard Hats	GM								WO 400 / WC

REMARKS:

Gross Contamination
Should be buried

MAXIMUM RADIATION MEASUREMENT OBTAINED: 40,000 c/m

MAXIMUM DOSE RATE

SIGNED R Ballard

UNCLASSIFIED

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SURVEY NO. 528041

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
337	Decon Rm	T-Met-3	8-29-56	2100 ~~AM~~ PM

DESCRIPTION

Monitoring for personnel while removing (sample probe) from Decon Cell & putting it in a fabricated box, for burial.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
2 x 30 MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ Max Dosage									WO / WC
	obtained while									WO / WC
	boxing	CP				140	18"	20	18"	WO / WC
	2/ Average dosage	CP				100	2'	10	2'	WO / WC
	3/ Reading through									WO / WC
	side of box	CP						3	2"	WO / WC
	4/ Smears of floor	TGM								WO 7,500 / WC
	5/ Survey of									WO / WC
	(2) personnel	TGM								WO 2000 / WC
	6/ Survey of (2) masks	TGM								WO <100 / WC

REMARKS:

4/ Floor was prepared and smear of floor was about average smear.
5/ One spot of 2,500 c/m was found on personnel coveralls. They were changed. Masks (Assault) were worn for this operation, & air sample was taken during first part of moving it was 4.5 x 10-10.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

140 mrad inc / 20 mr/hr

MAXIMUM DOSE RATE

140 mrad/hr

SIGNED

R. F. Alyea
R. L. Watts

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 528452

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	Canyon	T-met-3	10-15-56	11:00 ~~AM~~ PM

DESCRIPTION

Remove can of zirconium shavings from "F" Cell into waste carton.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	20 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max. D.R. on side of									WO / WC
	box.					Grad/hr	6"	4 r/hr	8"	WO / WC
	D.R. to pers. to remove									WO / WC
	with 8' tongs							250	F	WO / WC
	D.R. to tape box					Grad/hr				WO / WC
	D.R. thru steel									WO / WC
	shield							1500	2'	WO / WC
	D.R. at tape							10	F	WO / WC
										WO / WC
										WO / WC

REMARKS:

Sample extremely hot. Placed in box and put in steel shield. Should be buried at earliest convenience.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

Grad/hr at 6"

MAXIMUM DOSE RATE

4 rad/hr.

SIGNED

T. D. Cappel

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 528525

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
327	Canyon	T-MET-3	10-24-56	1800 AM PM

DESCRIPTION: Removing trash waste from E cell (irradiated aluminum)

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	15 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1	Max through side of waste carton CP							5 R/hr	4"	WO / WC
2	Max through steel shield							2500	2"	WO / WC
3	Max pers. DP to tape box							600	12"	WO / WC
4	Avg pers DR at platform lift controls							200	F	WO / WC
5	Floor smears around cell	TGM								WO / WC 3000

REMARKS: Waste cartons taped off @ 10 mr/hr

MAXIMUM RADIATION MEASUREMENT OBTAINED: 5 R/hr @ 4"

MAXIMUM DOSE RATE: 600 mr/hr

SIGNED: R L Watts

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 600077

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
321		Special	2-18-60	1330 ~~AM~~ PM

DESCRIPTION

Survey of Items for Disposal

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Elect Motor	GM								WO 4,000
										WC
										WO
										WC
	4 Elect Switches	GM								WO 7,000
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS: Gross Contamination

MAXIMUM RADIATION MEASUREMENT OBTAINED: 7,000 c/m

MAXIMUM DOSE RATE

SIGNED R Ballard

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 600162

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
326	11A	RSR	6-13-62	0830 ~~AM~~ ~~PM~~

DESCRIPTION

Cask (wrapped in plastic) Containing Zr-2 Waste going To 300 N

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	RA side of	CP						40	2"	WO
										WC
	Cask									WO
										WC
	Smears	GM								WO <100
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS: Released on RSR

MAXIMUM RADIATION MEASUREMENT OBTAINED: 40 mr/hr

MAXIMUM DOSE RATE

SIGNED R Ballard

UNCLASSIFIED

54—3000—190 (2—57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 600192

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
300 West		Property Disposal	9-MAY-60	1330 AM PM

DESCRIPTION

Survey of the following contaminated material prior to disposal.

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	one hood —	Tbm								WO 30,000
										WC
2.	one box stainless									WO
										WC
	scrap —	"								WO 2000
										WC
3.	Two chemo feed pumps	"								WO
										WC
	# 13208									WO 2,000
	# 13198	"								WC
4.	Two space heaters	"								WO
										WC
	# 384203									WO 4,000
	# 44000	"								WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

The above mentioned items were all found to be generally contaminated to the levels listed

MAXIMUM RADIATION MEASUREMENT OBTAINED: 30,000 c/m

MAXIMUM DOSE RATE —

SIGNED W. H. Parson

UNCLASSIFIED

54—3000—190 (2—57) AT:-GE, RICHLAND, WASH

UNCLASSIFIED

RADIATION SURVEY

SURVEY NO. 600220

600220

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
321	South Dock		5-24-60	AM PM

DESCRIPTION

Survey of Eastern Camp, Marshall Is for contamination from Pu disposal.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
		GM								WO
										WC
										WO
										WC
										WO
	Camp thoroughly									WC
	contaminated									WO 30,000
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 30,000 c/m

MAXIMUM DOSE RATE

SIGNED Bischoff

cc

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 600304

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
306	Shop	RSR	12-5-61	0830 AM ~~PM~~

DESCRIPTION

Survey of 30 Gal Drum For Release on RSR to 300 North Uranium Burial Ground — (Drum - Contains Coolant Liquid From Thorium Lathe)

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1 Direct Survey	H&M								WO 300
										WC
	2 Smears	H&M								WO <100
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS: Released on RSR

MAXIMUM RADIATION MEASUREMENT OBTAINED: 300 c/m

MAXIMUM DOSE RATE

SIGNED [illegible]

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 600560

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
326 T	300 N.	S.O.P.	8-15-63	1300 AM PM

DESCRIPTION

Transport 2-75# pigs loaded with irradiated graphite samples to 300 N. for Disposal -

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Max reading on pigs -	CP88						350	2"	WO / WC
2-	Max Dose rate to remove sample and dispose -	CP88				2.5 Rd/'				WO / WC
3.	Survey of personnel and vehical from burial ground	Field Test Gun -								WO <100. / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 2.5 Rad/hr

MAXIMUM DOSE RATE 2.5 Rad/hr

SIGNED [illegible]

UNCLASSIFIED

34-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 600958

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
321		Special	6-21-61	1100 AM ~~PM~~

DESCRIPTION

Monitor & Survey for Barrel to Burial Ground Containing Strontium & Thorium To Be Buried at 300N.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Max. R/Mon Outside of Drum	HGM								WO 250 / WC
2.	Smearable	HGM								WO <100 / WC

REMARKS

Because the barrel contained strontium it was hand loaded & unloaded to prevent breakage of flanges

RSR was issued to transport material

Monitor was in attendance at all times.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 250 c/m

MAXIMUM DOSE RATE N/S.

SIGNED [signature]

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 602641

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
300 North	B6	SQP	11-19-62	0845 AM ~~PM~~

DESCRIPTION

Monitor For Righting Crew to Buey Contaminated Swage Machine And Dump Load Hugger From 327 Bldg.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ Map R/M on									WO / WC
	Swage Machine	HGM								WO 6,000 / WC
	2/ Personnel +									WO / WC
	Equipment Survey	HGM								WO <100 / WC
	3/ Map R/M on									WO / WC
	Dry Waste pit	CP						30	15'	WO / WC
	4/ Map D/R to Dump									WO / WC
	Hugger	CP						30	15'	WO / WC
	5/ Dewar + Truck									WO / WC
	Survey	HGM								WO <100 / WC

REMARKS:

No Spread of Contamination Detected. Personnel informed of conditions —

MAXIMUM RADIATION MEASUREMENT OBTAINED: 30 mr/hr

MAXIMUM DOSE RATE 30 mr/hr

SIGNED: [illegible]

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 602865

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3706		S.O.P.	1-28-63	11:00 AM ~~PM~~

DESCRIPTION

Survey & monitor for load bugger & flat bed Truck dump @ 300 North.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	dumpster box	CP						200	3'	WO / WC
										WO / WC
	Refrigerator	CP						<6	2"	WO / WC
										WO / WC
	metal grating	CP						150	2"	WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

vehicles surveyed & found free of contamination

care was taken to have hot waste cartons roll to bottom of trench

MAXIMUM RADIATION MEASUREMENT OBTAINED:

200 mr/hr @ 3'

MAXIMUM DOSE RATE

200 mr/hr @ 3'

SIGNED W C Parker

UNCLASSIFIED

54—3000—190 (2—57) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 602976

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
321	outside	S.O.P.	2-28-63	0900 AM ~~PM~~

DESCRIPTION

Survey of material from the roof of 321 bldg for burial at 300 North Area

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MI

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	one control pannel	T6M								WO 15,000
										WC
	four electric Switch,	T6M								WO 5,000
										WC
	boxes									WO
										WC
	20' 2" angle iron	T6M								WO 15,000
										WC
	one sheet iron	T6M								WO 20,000
										WC
	(1/4" x 4' x 8')									WO
										WC
	50' conduit	T6M								WO 20,000
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

Above material placed in dumpster for contaminated equipment.

Men working on the Job wore white coveralls rubbers and glove. Surveyed after work.

Reviewed and Approved for Public Release by the NSAT
W.F. Nicaise PNNL ADD
10-27-2001 Date

MAXIMUM RADIATION MEASUREMENT OBTAINED: 20,000 c/m

MAXIMUM DOSE RATE

SIGNED W E Parker

UNCLASSIFIED

54-1000-190 (2-57) AEC-GE, RICHLAND WASH

UNCLASSIFIED

SURVEY NO. 603580

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
Buried			8-22-63	1515 PM

DESCRIPTION: Monitor & Survey for Thorium Lugger

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS 90 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Max R/M on Lugger	HGM								WO <100
										WC
		SPP		<500						WO
										WC
2.	Max Smears on	SPP		<500						WO
	Lugger									WC
		HGM								WO <100
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

Lugger was cleared for more waste.

Could be going to BIE-7

MAXIMUM RADIATION MEASUREMENT OBTAINED: <100 c/m

MAXIMUM DOSE RATE <100 c/m

SIGNED: R.C. [illegible]

UNCLASSIFIED

Ed-3000-190 (2-57)

UNCLASSIFIED

SURVEY NO. 606338

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
305-B	Top of Clean Rm	S.E.P.	3-[redacted]-61	1:00 [redacted] PM

DESCRIPTION

Monitor the movement of contaminated equipment from 305-B assembly room over clean, flat lot (across road) going to 300 North burial pit.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	R.M. of wrapped equipment, crane hook, chains, gloves, personal things etc.	P								WO
										WC
										WO
										WC
										WO < 100
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC
										WO
										WC

REMARKS:

Items were placed in 300 N burial pit no spread of contamination detected

MAXIMUM RADIATION MEASUREMENT OBTAINED:

None

MAXIMUM DOSE RATE

None

SIGNED

J. D. Cadman

UNCLASSIFIED

54-3000-190 (2-57) AEC-GE, RICHLAND, WASH

PAGE 02 JUDAREMEDIALACTION

UNCLASSIFIED

SURVEY NO. 625622-B

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
327	Canyon	~~T-Act~~ 3	12-16-55	1830 AM PM

DESCRIPTION

Special Survey of Air in Canyon for Potential Air Contamination Caused by Nitric Acid and Acetone Swabs mixed in Dry Waste Box.

ROUTINE MON. ~~X~~ SPECIAL 2½ hrs ~~WEEK~~ SWP INTERMITTENT MIN. SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrads/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1	Cask Storage - 1830 PM -		4.5	$\times 10^{10}$						WO / WC
2	C-Cell #1 - 1830 PM -		4.3	$\times 10^{10}$						WO / WC
3	C-Cell #2 - 2030 PM -		8.7	$\times 10^{10}$						WO / WC
4	E-Cell #1 - 1830 PM -		5.6	$\times 10^{10}$						WO / WC
5	E-Cell #2 - 2030 PM -		5.8	$\times 10^{10}$						WO / WC
6	Tensil Cell #1 - 1830 PM -		3.4	$\times 10^{10}$						WO / WC
7	Tensil Cell #2 - 1900 PM -		1.3	$\times 10^{9}$						WO / WC
8	Tensil Cell #3 - 2015 -		6.3	$\times 10^{10}$						WO / WC
9	Special Staplex Tensil Cell -		1900 PM -			1.1	$\times 10^{10}$			WO / WC
10	Special Nose Smear -	TEM								WO <100 / WC

REMARKS:

1. All Samples Gathered IN Assault Mask Canyon Cleared of Personnel
2. Samples Re Counted in one hour to two hr. And They decayed OFF to $< 1.0 \times 10^{-10}$

MAXIMUM RADIATION MEASUREMENT OBTAINED: 1.3×10^{9}

MAXIMUM EXPOSURE RATE:

SIGNED G. G. Whitsitt, R. F. Massey Jr.

UNCLASSIFIED

J-94-DS (2-54) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 626406

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	Canyon	T-McY-3	3-1-54	1130 AM ~~PM~~

DESCRIPTION: Survey check of Lattice which is to be taken to Burial Garden

ROUTINE MIN. | SPECIAL MIN. | SWP INTERMITTENT MIN. | SWP CONTINUOUS 30 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ Smear	TGM								WO 2000 TO
	of Lattice									WC 5000
										WO
										WC
	2/ Check out of									WO
	personnel to									WC
	Burial Garden (2)	TGM								WO 2100
										WC
										WO
										WC
	3/ Check of truck									WO
										WC
	68A-4714	TGM								WO <100
										WC
	4/ Readings exposed									WO
	to Burial Garden	CD						10	F	WC

REMARKS:

1/ Lattice Number was H.E.W. 418958. It was buried in the 300 North Burial Garden.

2/ 3/ Personnel & Truck were released.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 10 mr/hr + 5000 c/m

MAXIMUM DOSE RATE: 10 mr/hr

SIGNED: R. L. Clapp

UNCLASSIFIED

J-94-OS (2-55) HANFORD WORKS, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 626614

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327	Canyon	T-MET-3	3-23-56	1530 ~~AM~~ PM

DESCRIPTION

To remove sanding disk from C-cell
To waste carton

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	15 MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	Max. Dose Rate									WO / WC
	on Box	CP				10 Rad	2'	700	2'	WO / WC
		TP						100R. S.		WO / WC
	Max. Dose Rate									WO / WC
	To Personnel	CP				1 Rad	3'			WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

Personnel Notified of Conditions

-Assault Masks worn.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 100 R/hr @ S. 10 Rad/hr @ 2' including 700 mR/hr

MAXIMUM DOSE RATE 1 Rad/hr @ 3'

SIGNED R. Carter

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 62680

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
327	DeCon Room	Special	4-10-56	1700 AM PM

DESCRIPTION: Survey of electrical equipment to be placed in burial ground.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	/ X 30 MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μcm PU	mrad/hr	DIST.	mr/hr	DIST.	c/m AT 1"
1.	Furnace #HEW-425117-TGM									WO 2000
										WC
	Smears - General	TGM								WO 1000
										WC
2.	Conco-Megavac Pump	TGM								WO 3000
										WC
	+ Motor #HEW-423702									WO
										WC
	Smears - General	TGM								WO 1000
										WC
3.	7½ H.P. GE Motor	CF				5	S	2	2"	WO
										WC
	#HEW-50499 Serial EX1504									WO
										WC
	Smears - General	TGM								WO 1000
										WC
										WO
										WC
										WO
										WC

REMARKS: Released for burial.

Copy to operating supervision.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 5 mrad/hr inc. 2 mr/hr @ 2"

MAXIMUM DOSE RATE

SIGNED J. L. Maffiello

J-94- OS (2-55) ASCHE, SCHLATE, WASH

UNCLASSIFIED

UNCLASSIFIED

RADIATION SURVEY

PLUTONIUM RECYCLE TEST REACTOR – 309 BUILDING

SURVEY NUMBER: 530512

LOCATION	~~R.W.P.~~ NUMBER	DATE MO. DAY YEAR	TIME OF SURVEY (AM / PM)	INSTRUMENT NUMBER
300N burial ground RSR		3-28-63	0930	CP SPP H6m

DESCRIPTION: monitored & surveyed for personnel to haul pu pump & PM147 source to burial ground.

ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	mrad/hr	DIST.	mr/hr	DIST.	NEUTRON mrem/hr	(INDICATE FAST OR SLOW)	DIST.	c/m AT 1 IN.
1/ max Rbm on source thru con.	CP			10	2"						WO / WC
2/ max D/Rate to personnel at burial ground	CP					1200	2'				WO / WC
3/ Survey of personnel	H6m SPP		<500								WO <200 / WC
4/ Survey of truck	H6m SPP		<500								WO <200 / WC

REMARKS: personnel informed
material removed from 308 to burial ground

USE REVERSE SIDE FOR ADDITIONAL REMARKS

MAXIMUM RADIATION MEASUREMENT OBTAINED: 1200 mr/hr

☐ CONTINUOUS MONITORING PROVIDED
☐ INTERMITTENT MONITORING PROVIDED

MAXIMUM PERSONNEL DOSE RATE: 1200 mr/hr

SIGNED: W. D. Leonard

ITEMIZE ON REVERSE SIDE NAMES OF ALL PERSONNEL RECEIVING DOSE RATE = OR > 1 r/hour; ALSO, NAMES OF THOSE RECEIVING TOTAL BODY EXPOSURE = OR > 100 mr

UNCLASSIFIED

BD-7800-102 (6-61)
AEC-GE RICHLAND, WASH.

UNCLASSIFIED

RADIATION SURVEY

PLUTONIUM RECYCLE TEST REACTOR - 309 BUILDING

SURVEY NUMBER: 630949

LOCATION	R.W.P. NUMBER	DATE MO. DAY YEAR	TIME OF SURVEY	INSTRUMENT NUMBER
Loadout & 300N Burial Grd.	Special	5/31/63	1330 ~~AM~~ ~~PM~~	C-284, GM-174

DESCRIPTION: Monitor for operations to load irradiated fuel hanger & take same to 300N burial ground.

ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	mrad/hr	DIST.	mr/hr	DIST.	NEUTRON mrem/hr	(INDICATE FAST OR SLOW)	DIST.	c/m AT 1 IN.
Max RM thru side of barrel.						2.5R	2"				WO / WC
Pre D/R to load	CP					200	12"				WO / WC
Max D/R to wrap in plastic (top end)						2.0R	15"				WO / WC
D/R in cab outgoing.	CP					120	F				WO / WC
Personnel & vehicle											WO / WC
survey upon leaving burial ground.				(GM)							WO <200 / WC
											WO / WC
											WO / WC
											WO / WC
											WO / WC

REMARKS: Personnel informed of above conditions.

USE REVERSE SIDE FOR ADDITIONAL REMARKS

MAXIMUM RADIATION MEASUREMENT OBTAINED: 2.5 R/hr

MAXIMUM PERSONNEL DOSE RATE: T. Doupe 2.0 R/hr

☐ CONTINUOUS MONITORING PROVIDED
☐ INTERMITTENT MONITORING PROVIDED

SIGNED: C. A. Morlande

ITEMIZE ON REVERSE SIDE NAMES OF ALL PERSONNEL RECEIVING DOSE RATE = OR > 1 r/hour; ALSO NAMES OF THOSE RECEIVING TOTAL BODY EXPOSURE = OR > 100 mr

UNCLASSIFIED

BD-7800-102 (6-61)

AEC-GE RICHLAND, WASH.

680280

UNCLASSIFIED

SURVEY NO. 680280

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
300N	B.O.		6-7-57	1300 ~~AM~~ PM

DESCRIPTION

Monitoring While Personnel Transfers 3 C.W. Barrels & 2 R.R. Wheels from 1171 Bldg. To 300. N. Burial Ground

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	130 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ Max. Rd. of Barrels	Tom								WO <100 / WC
	2/ Max. Rd. of Wheels	Tom								WO 300. / WC
	3/ Max. Rd. At N. Pit	CP						100	F	WO / WC
	4/ 2 ea - Personnel	Tom								WO -100 / WC
	5/ NO-68B-5470	Tom								WO <100 / WC
	6/ NO-34-5471	Tom								WO 400 / WC
	7/ D/12 To Monitor At Pit	CP						100	F	WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

4- Released
5- & 6-- Contamination Located On Left Piston Bellow Cover -- Personnel Notified & Agreed To Have Equipment Cleaned

MAXIMUM RADIATION MEASUREMENT OBTAINED: 100 mr/hr

MAXIMUM DOSE RATE ~~100 mr/hr To Body~~

SIGNED J. A. Whitlatt

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 810046

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
327a B.G.			4-25	1:30 ~~AM~~ PM

DESCRIPTION

Escort Dump Truck with Cave from 327 Bldg.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	4.5 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	D.R. to driver	C-P						4		WO / WC
	at trench									WO / WC
	Luggage of truck	TGM								WO <100 / WC
	& personnel									WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS: One door came open enroute, & was closed & taped before continuing trip

MAXIMUM RADIATION MEASUREMENT OBTAINED:

MAXIMUM DOSE RATE

SIGNED R.W. Simmons

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

cyanide powder

UNCLASSIFIED

SURVEY NO. 810114

RADIATION SURVEY

NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
N	Burial Garden	50P	11-26-57	1600 PM

TION

Set time limits for laborers to shovel dirt over a barrel of cyanide powder at the 300-North Burial Garden.

E MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS 120 MIN.

ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrad/hr	DIST.	mr/hr	DIST.	c/m AT 1"
ge D/R to body from									WO / WC
ste container by barrel	CP				all γ		1000	3'	WO / WC
ge D/R to body	CP				all γ		600	6'	WO / WC
D/R at edge of burial									WO / WC
it.	CP				all γ		200	F	WO / WC
Direct check of 2 men.	TBM								WO < 100 / WC
									WO / WC
									WO / WC
									WO / WC
									WO / WC
									WO / WC
									WO / WC

KS:

Barrel was not completely covered with dirt due to exposure time. Spilled material apparently was covered.

UM RADIATION MEASUREMENT OBTAINED:

UM DOSE RATE 1 R/hr @ 3'

Same

SIGNED R McBurell

UNCLASSIFIED

836602

UNCLASSIFIED

SURVEY NO. 836602

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3745 B			12-16-58	1:15 ~~AM~~ PM

DESCRIPTION

Monitor Antimony Beryllium Source for Burial

ROUTINE MIN.	SPECIAL MIN.	SWP INTERMITTENT MIN.	SWP CONTINUOUS MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/ DR. o max	C.P.						170	2"	WO / WC
	3/ DR. to fallen							20		WO / WC
	carton lbp. o. any									WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 120 mr/hr

MAXIMUM DOSE RATE 20 mr/hr

SIGNED R Simmons

UNCLASSIFIED

54—3000—190 (2—57) AYC-GE, RICHLAND, WASH

UNCLASSIFIED

SURVEY NO. 860015

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
300 North Burial			6-5-59	12 45 ~~AM~~ PM

DESCRIPTION

Monitor burial of steel tank and glove box ~~of~~ in burial ground

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1	Max R/m from tank	CP						100	4'	WO / WC
2	D/R to hook up + unhook	" +		at side of tank				30	2'	WO / WC
3	Survey of three personnel	H6m								WO < 100 / WC
4	Survey of MC. 68B-9491 + Cable	"								WO < 100 / WC

REMARKS:

MAXIMUM RADIATION MEASUREMENT OBTAINED: 100 mr/hr

MAXIMUM DOSE RATE 30 mr/hr

SIGNED Schulke

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 860039

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
3706	307	CO-661-300 Ext.	1-20-58	1400 ~~AM~~ PM

DESCRIPTION

Survey of Minnr Cons't equipment for burial in 300 North Burial Garden

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	1 X 60 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μμc Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	(1) 5 Scaffold Planks	SPP		2000	(MAX)					WO / WC
	(2) 2 Safeway Scaffold Frames	SPP		1000	(Smears)					WO / WC
	(3) 2 Pipe Wrenches	SPP		1000	(MAX)					WO / WC
	(4) 1 Crèsent Wrench	SPP		1000	(MAX)					WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

All Material was well wrapped, and will be buried at a future date.

Scaffold Planks were contaminatied with four or five spots on each one,

MAXIMUM RADIATION MEASUREMENT OBTAINED: 2000 d/m

MAXIMUM DOSE RATE

SIGNED K. B. Elledge

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 860044

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S. W. P. NUMBER	DATE	TIME OF SURVEY
3706	307	CO-661-300 Ext.	1-23-58	1300 AM PM

DESCRIPTION

Tools that became contaminated and were discarded in the 300 Area Burial Ground.

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	μgm Pu	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
1	(1) Hacksaw Frame	Poppy		2000						WO / WC
										WO / WC
2	(2) Tin snips	Poppy		1000 / 3000						WO / WC
										WO / WC
3	(1) Hammer	Poppy		2000						WO / WC
										WO / WC
4	(1) Screwdriver	Poppy		5000						WO / WC
										WO / WC
5	(1) pliers-dikes	Poppy		2000						WO / WC
6	(1) Vise Grips	Poppy		1000						WO / WC

REMARKS:

All tools boxed and buried.

MAXIMUM RADIATION MEASUREMENT OBTAINED:

5000 d/m

MAXIMUM DOSE RATE

None

SIGNED

M. H. Lisle

UNCLASSIFIED

UNCLASSIFIED

SURVEY NO. 860085

RADIATION SURVEY

BUILDING NO.	ROOM NO.	S.W.P. NUMBER	DATE	TIME OF SURVEY
327	Basement	CD-306-58	5-19-58	0800 AM ~~PM~~

DESCRIPTION

Monitor for Personnel to Cut and wrap old S/S waste line for burial

ROUTINE	SPECIAL	SWP INTERMITTENT	SWP CONTINUOUS
MIN.	MIN.	MIN.	100 MIN.

NOT REG.	ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	µgm PU	mrad /hr	DIST.	mr/hr	DIST.	c/m AT 1"
	1/Max Radiation on									WO / WC
	old Line	CD						5 mr	4"	WO / WC
	2/Max D/R to wrap	CD						150	18"	WO / WC
	3/Smear on Floor									WO / WC
	Area Survey	HGM								WO <100 / WC
	4/Personnel Surveys	HGM								WO <100 / WC
										WO / WC
										WO / WC
										WO / WC
										WO / WC

REMARKS:

No Spread or Contamination Noted - Pipes were Wrapped in Corridor outside of Green House - No Spread of Contamination Found.

MAXIMUM RADIATION MEASUREMENT OBTAINED: 5 mr/hr

MAXIMUM DOSE RATE 150 mr/hr

SIGNED J. B. Elledge

UNCLASSIFIED

J-94- DS (2-55) AEC-GE, RICHLAND, WASH

UNCLASSIFIED

RADIATION SURVEY

PLUTONIUM RECYCLE TEST REACTOR - 309 BUILDING

SURVEY NUMBER

LOCATION	R.W.P. NUMBER	DATE MO. DAY YEAR	TIME OF SURVEY	AM / PM	INSTRUMENT NUMBER
325 + N. Burial Grounds		12-31-62	1330		Poppy, HGM & CP

DESCRIPTION

Monitor removal of Minnie Curie parts + Concrete barrels from 325 labs to 300 north burial grounds.

ITEM OR LOCATION	INST. USED	AREA SQ. IN.	MAX. d/m	mrad/hr	DIST.	mr/hr	DIST.	NEUTRON mrem/hr	(INDICATE FAST OR SLOW)	DIST.	c/m AT 1 IN.
Smears of all minnie parts	Poppy HGM		<500 d/m			<2 mr					WO <100 c/m; WC
Smears of barrels	HGM										WO <100 c/m; WC
Direct reading on barrels	CP					20/30	at S				WO; WC
dose rate to handle barrels	CP					10	1'				WO; WC
Survey of personnel out of burial grounds	Poppy HGM		<500 d/m								WO <100 c/m; WC
Survey truck, trailer + hydro crane out of burial grounds	Poppy HGM		<500 d/m								WO <100 c/m; WC
dose at edge of pit	CP					10	F				WO; WC
											WO; WC

REMARKS:

Hood box broke completely apart when placing same into pit. Parts flew all over side of burial grounds. Possibly high level on slopes of pit. Supervision notified

USE REVERSE SIDE FOR ADDITIONAL REMARKS

MAXIMUM RADIATION MEASUREMENT OBTAINED: 30 mr/hr

MAXIMUM PERSONNEL DOSE RATE: 10 mr/hr

☑ CONTINUOUS MONITORING PROVIDED
☐ INTERMITTENT MONITORING PROVIDED

SIGNED: Al Mata

ITEMIZE ON REVERSE SIDE NAMES OF ALL PERSONNEL RECEIVING DOSE RATE = OR > 1 r/hour; ALSO, NAMES OF THOSE RECEIVING TOTAL BODY EXPOSURE = OR > 100 mr

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BD-7800-102 (6-61)

AEC-GE RICHLAND, WASH.